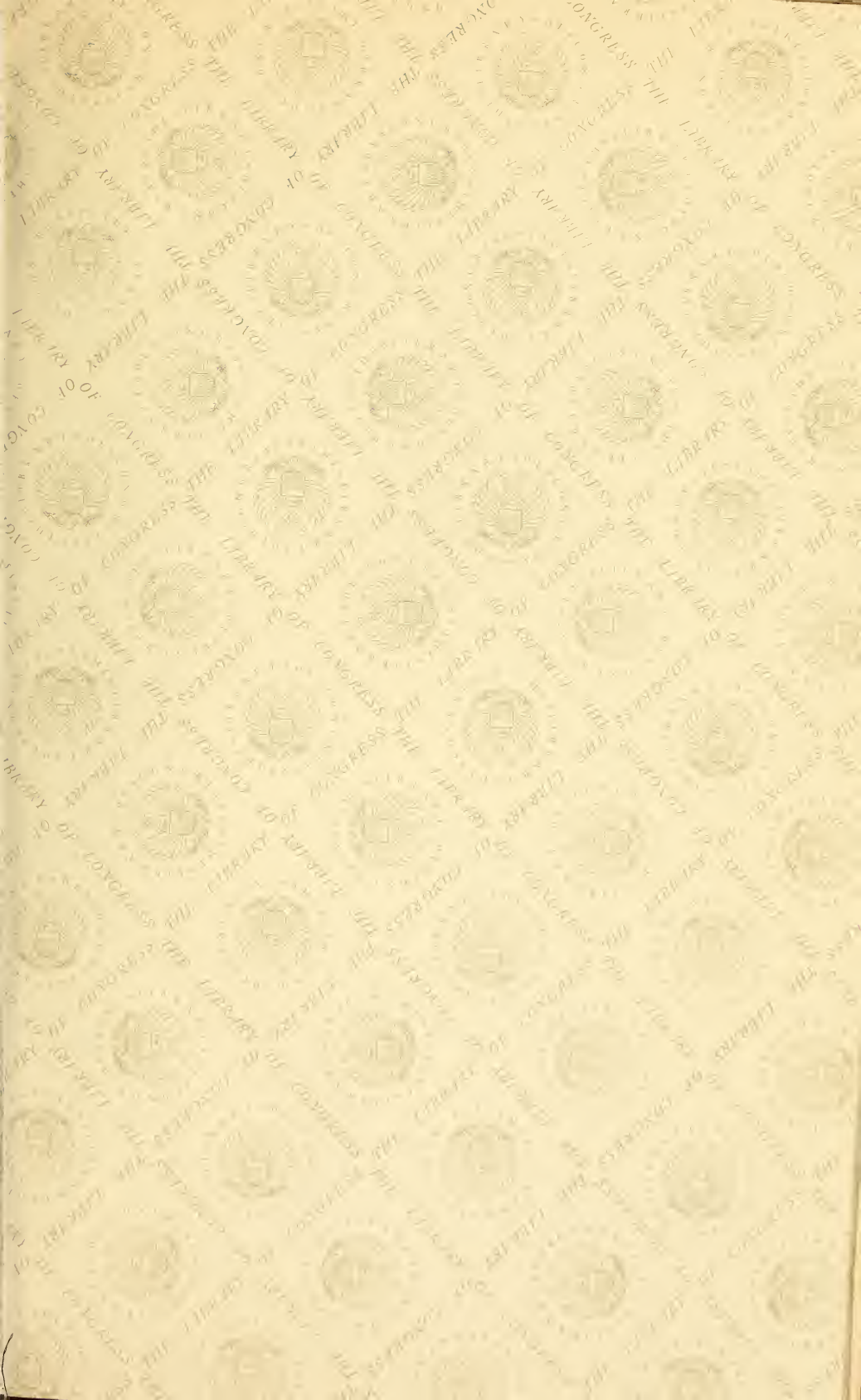
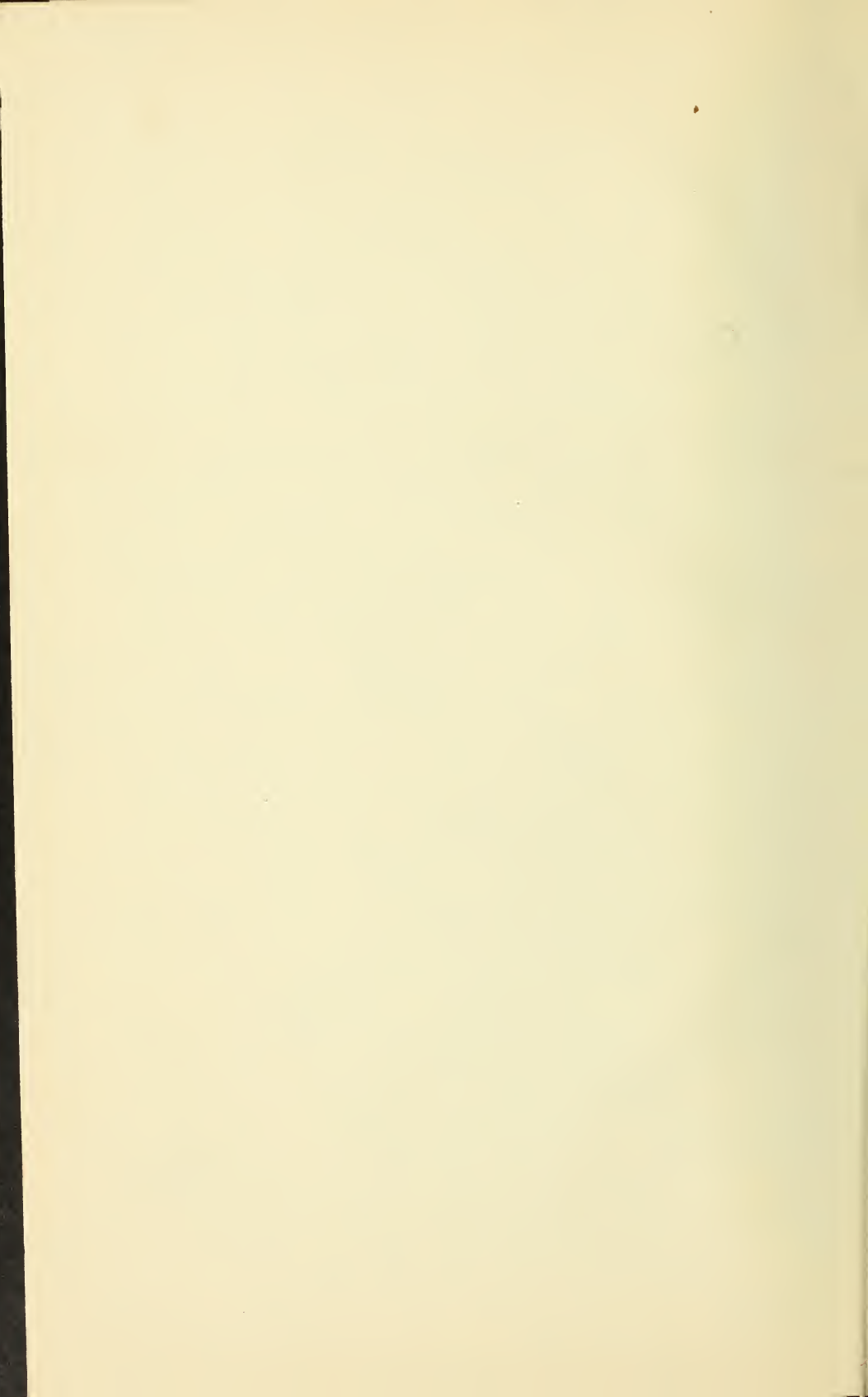


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# HARVARD UNIVERSITY.

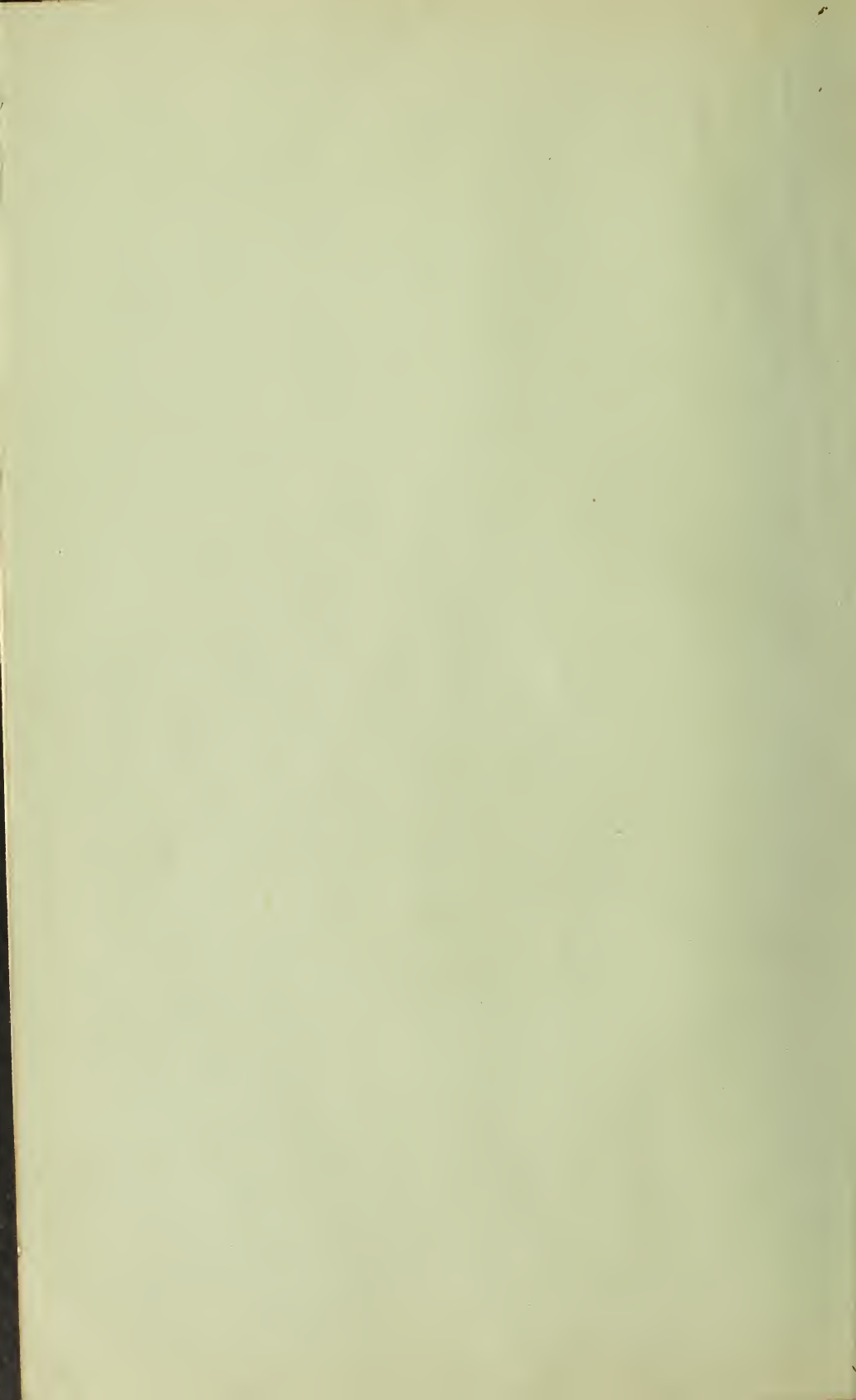
A BRIEF STATEMENT OF WHAT HARVARD UNIVERSITY IS,  
HOW IT MAY BE ENTERED AND HOW ITS  
DEGREES MAY BE OBTAINED.

By FRANK BOLLES,  
*Secretary of Harvard University.*

THIRD ANNUAL EDITION.



PUBLISHED BY  
Harvard University,  
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PREFATORY NOTE.

This descriptive statement is designed to answer, in a less formal way than the annual Catalogue answers them, many of the questions which intelligent inquirers ask concerning Harvard University and its ways and means. In preparing this third edition I have drawn freely upon material recently published in the *Harvard Graduates' Magazine* and in the department pamphlets of the University.

FRANK BOLLES.

CAMBRIDGE, April, 1893.





## HARVARD UNIVERSITY.

A BRIEF STATEMENT OF WHAT HARVARD UNIVERSITY IS, HOW IT MAY  
BE ENTERED, AND HOW ITS DEGREES MAY BE OBTAINED.

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Harvard College is the oldest of American institutions of learning, having been founded in 1636. What is now known as Harvard University includes the College, the Scientific School, the Graduate School, and six Professional Schools.

The College, Scientific School, and Graduate School, and the Divinity and Law Schools are situated in Cambridge, Massachusetts, a city of over 70,000 inhabitants. The Medical School, the Dental School, the School of Veterinary Medicine, and the Bussey Institution (a school of Agriculture and Horticulture) are situated in Boston, a city of about 450,000 inhabitants. The two cities are connected by steam, electric, and horse railways, and are separated by the Charles River. The distance from the College buildings to the business centre of Boston is three miles.

The University is governed primarily by two Boards, the Corporation and the Overseers. The Corporation (of which the legal title is the President and Fellows of Harvard College) consists of the President, Treasurer, and five Fellows, all of whom hold office for life. In it is vested the title to the property of the University, estimated to be worth somewhat more than twelve million dollars. The Overseers number thirty-two, including the President and Treasurer of the University, who are *ex officio* members. Five of the Overseers go out of office each year, their places being filled on Commencement Day by an election in which alumni of the College of five years standing, Masters of Arts, and holders of honorary degrees from the University are entitled to vote, if present in person.

The principal administrative officers of the University are the President, the Treasurer, the Deans of the various Faculties, Schools, and Administrative Boards; the Bursar, and the Secretary. The President is the presiding officer of the Corporation and of each of the Faculties, and he exercises a general superintendence over all the manifold concerns of the institution. The Treasurer is the custodian of the property of the University, makes its investments, and keeps its financial accounts. The Deans conduct the business of their several Faculties or Administrative Boards. The Bursar is the Treasurer's agent in dealing with students, in renting rooms, settling

term bills, and similar matters. The Secretary conducts the correspondence of the University.

The College, Scientific School, and Graduate School are under the control of the Faculty of Arts and Sciences, from which are appointed three executive committees, called Administrative Boards, each of which has its Dean, and by which the College, the Scientific School, and the Graduate School are severally governed.

Each Professional School has a separate Faculty, composed of all its professors and other teachers holding appointments for more than one year.

The degrees conferred upon the recommendation of the various departments are eleven in number, as follows:—

By the Faculty of Arts and Sciences: Bachelor of Arts, Bachelor of Science, Master of Arts, Doctor of Philosophy, and Doctor of Science.

By the Faculty of the Divinity School: Bachelor of Divinity.

By the Faculty of the Law School: Bachelor of Laws.

By the Faculty of the Medical School: Doctor of Medicine.

By the Faculty of the Dental School: Doctor of Dental Medicine.

By the Faculty of the Veterinary School: Doctor of Veterinary Medicine.

By the Faculty of the Bussey Institution: Bachelor of Agricultural Science.

The degrees of Bachelor of Arts and Bachelor of Science are given in four grades, *summa cum laude*, *magna cum laude*, *cum laude*, and without distinction. The degree of Bachelor of Laws is given in two grades, *cum laude* and without distinction. No two degrees are given for a single course of study, and no degree is given without residence and study for at least one year.

The degrees of Doctor of Laws, Doctor of Divinity, and Master of Arts, *honoris causâ*, are conferred upon eminent persons selected by the Corporation and approved by the Overseers.

The roll of graduates of the University includes the names of over 18,000 men, of whom more than one half are supposed to be living.

The libraries of the University contain over 400,000 bound volumes and an approximately equal number of pamphlets. Students are charged no fees for the use of books. Ample endowments make it possible for teachers to have books of reference needed for the instruction of their classes purchased by the Library.

In addition to the various departments already named, the University has several other important branches which will be described subsequently. These are the Astronomical Observatory, the University Museum, including the Museum of Comparative Zoölogy and its Natural History Laboratories, the Botanical and Mineralogical Muse-

ums, the Peabody Museum of American Archaeology and Ethnology, the Semitic Museum, the Anatomical Museum, the Botanic Garden, the Herbarium, the Arnold Arboretum, the Chemical Laboratory, the Jefferson Physical Laboratory, and the Veterinary Hospital. The Hemenway Gymnasium is for the use of the whole University. The University chapel, seating 900 persons, is controlled by the Preachers to the University, who are ordained ministers representing different Protestant denominations. The Harvard Dining Association, occupying the great dining hall in Memorial Hall, is a voluntary association which provides about 1100 officers and students with a good quality of board at cost price, usually about \$4 a week. The Harvard Coöperative Society is a voluntary association of officers and students which supplies members of the University with books, stationers' materials, fancy articles, men's furnishing goods, and a great variety of miscellaneous articles. Its annual sales amount to about \$100,000. The Foxcroft Club is a third association of a coöperative character composed largely of students living at home or at a distance from the College buildings. It has study rooms, lunch rooms, a consulting library, and other conveniences adapted to the needs of non-resident students. Meals are supplied at cost by the card, and the average expenditure per man is less than \$2.80 a week. These three associations are managed by boards of directors chosen by ballot from among the officers and students of the various departments of the University. There is also a Loan-Furniture Association, managed by officers and students, which lends students sets of furniture at a price just sufficient to replace the property as it is worn out. The charge for a set is \$5 a year.

The University owns in Cambridge twelve dormitories or halls. These have accommodations for 973 students, provided all double rooms are occupied by two persons. As a matter of fact the number of double rooms held by students preferring to lodge alone is large. Rents range from \$25 to \$350 a year. Full information regarding prices and the methods of securing rooms can be obtained from the Bursar. There are a number of large private dormitories adjoining the College grounds, and students are received as lodgers or boarders in many private houses in various parts of Cambridge, Boston, and suburban towns. Furnished rooms, suitable for either one or two persons, are obtainable at a distance from the College Yard at low rents, as for example from \$35 to \$75 a year. Good order is maintained in College and private dormitories by graduates or instructors holding appointments as Proctors. Proctors are under the direction of the Regent. At the discretion of the Regent, a Proctor may be placed in any private house where students lodge, if the maintenance of good order in the house seems to require it.

The athletic sports of the University are regulated by a commission, composed of three graduates, three professors, and three students, which acts independently of any Faculty. The sports include rowing, canoeing, base-ball, foot-ball, lacrosse, lawn-tennis, cricket, polo, rifle-shooting, hare and hounds races; track athletics, including bicycle racing, running and jumping; and gymnasium exercises of various kinds, which are under the general supervision of Dudley A. Sargent, M.D., the Director of the Gymnasium. The athletic facilities of the University are excellent. The Charles River with its miles of broad surface is only a few minutes' walk from the College. The University Boat Houses are conveniently located on its shores. The foot-ball, base-ball, lawn tennis, and other fields are in the immediate vicinity of the Gymnasium, and of the Carey Athletic Building. The country roads around Cambridge are well made, inviting horseback and bicycle riding, driving, and walking. Skating and tobogganing are popular sports in their season, which lasts in ordinary years from December to March. The principal athletic events of the year are the foot-ball games in the autumn, the gymnasium contests in the winter, the base-ball and track athletic sports in the spring, and the annual boat races at New London in the early summer. Only students whose conduct and standing in College and whose physical condition are satisfactory are allowed to take part in public athletic contests or similar exhibitions. The money accounts of the various athletic organizations are under the direction of a graduate treasurer appointed by the Athletic Commission.

The University contains a great number of literary, dramatic, religious, scientific, musical, and social societies. Among the most prominent are the Union, where social and political questions of national interest are debated; the Hasty Pudding Club, founded in 1795, which has a large club-house and theatre; the Harvard branch of the Y. M. C. A.; the Total Abstinence League; the Deutscher Verein and Conference Française; the Philosophical Club; the Finance Club; the Signet; the Natural History Society; the Camera Club; the Glee Club and Pierian Sodality; and several Greek letter societies. In the Law School are several clubs which conduct Moot Courts at stated periods. The other professional Schools have analogous societies which form useful adjuncts to class-room work.

The University itself publishes an annual catalogue (price 85c.); the annual report of the President and Treasurer; the Quarterly Journal of Economics; the Historical Monographs; Studies in Classical Philology; the Library Bulletin; the Weekly Calendar; and various pamphlets for general distribution. The alumni publish the Harvard Graduates' Magazine, and students publish the Law Review;



the Harvard Monthly ; Advocate ; Lampoon (illustrated fortnightly) ; and the Daily Crimson. The experience obtained on these papers, especially the last-named, enables some of their editors to make successful beginnings in journalism as soon as they leave College, and to earn money during their College course by serving as correspondents for some of the city journals.

Students can earn money while in Cambridge by private tutoring ; singing in the College Choir and in the choirs of the neighboring churches ; doing clerical or stenographic work ; and type-writing. Active, energetic students, while able to live as cheaply in Cambridge as at colleges in rural districts, find not only that there are more ways of earning money, but that more is paid them for the same services. As is shown by the accompanying table, the University distributes over \$89,000 a year in scholarships, beneficiary funds, and prizes. Merit and need are the elements which determine distribution.

INCOME OF FUNDS, AND OTHER SUMS AVAILABLE IN 1892-1893 IN HARVARD UNIVERSITY, AS MONEY-AIDS TO STUDENTS.

<i>Graduate School.</i>	Fellowships . . . . .	\$13,050
“ “	Scholarships . . . . .	11,400
“ “	Humboldt Fund . . . . .	450
“ “	Prizes . . . . .	1,025*
<i>Harvard College.</i>	Scholarships . . . . .	22,395
“ “	Beneficiary Funds . . . . .	19,200
“ “	Loan Funds . . . . .	3,300
“ “	Prizes . . . . .	1,065
<i>Lawrence Scientific School.</i>	Scholarships . . . . .	3,600
<i>Divinity School.</i>	Scholarships . . . . .	1,360
“ “	Beneficiary Funds . . . . .	690
“ “	Hopkins Fund . . . . .	1,950
“ “	Williams Fund . . . . .	4,000
“ “	Williams Fellowships . . . . .	1,000
<i>Law School.</i>	Scholarships . . . . .	1,500
“ “	Prizes . . . . .	100
“ “	Foster Fund . . . . .	[150]†
<i>Medical School.</i>	Fellowships . . . . .	675
“ “	Scholarships . . . . .	1,700
“ “	Foster Fund . . . . .	150†
“ “	Prizes . . . . .	475
		<u>\$89,085</u>

\* Many prizes open to graduate students are also open to undergraduates and to students in other departments.

† The income of the Foster Fund is available in the Law School and the Medical School in alternate years.

The annual outlay of an economical student who comes to Cambridge with a good supply of clothing and bed linen is necessarily nearly \$400. For tuition he must pay \$150 (except in the Divinity School, where the fee is \$50; and in the Medical School, where it is \$200). A room furnished, lighted, and warmed cannot well cost less than \$35, even if it is small and inconveniently located. Books, stationery, and laboratory fees amount to about \$20 a year; and washing to at least \$15. Wholesome food can be procured for about \$2.75 a week, although a few students live for a little less. Sundries may reach \$40 for the year, especially if by living at a distance the student spends a good deal in car fares. Allowing nothing for clothing, these estimates would make the expenses of the first year in College \$367. After that they tend to grow larger. Students who are not forced to practice strict economy of course spend more than the sums named. Perhaps a quarter of each college class live on less than \$600 a year, clothes included. Another quarter spend between \$600 and \$800. Every dollar over \$1200 which even the richest student spends is, as a wise writer on this point has said, "a dollar of danger." The same writer has said as to the advisability of encouraging poor men to come to Harvard:—

"Whenever you encounter a poor boy of eager, aggressive mind, a youth of energy, one capable of feeling the enjoyment of struggling with a multitude, and of making his merit known, say to him that Harvard College is expressly constituted for such as he. Here he will find the largest provision for his needs and the clearest field for his talents. Money is a power everywhere. It is a power here; but a power of far more restricted scope than in the world at large. In this magnificent hall (Memorial) rich and poor dine together daily. At the Union they debate together. At the clubs which foster special interests,—the Finance Club, the Philological Club, the Philosophical Club, the French Club, the Signet, and the O. K.,—considerations of money have no place. If the poor man is a man of muscle, the athletic organizations will welcome him; if a man skilled in words, he will be made an editor of the college papers; and if he has the powers that fit him for the place, the whole body of his classmates will elect him Orator, Ivy Orator, Odister, or Poet, without the slightest regard to whether his purse is full or empty."

Since this was written its truth has been strikingly exemplified by the election to the class oratorship of a man who had not only worked his way into and through College, but who was of unmixed negro blood.

The following letter tells the story of a recent graduate who made his way through College upon the slenderest income, and graduated

with distinction after helping several of his classmates whose ability was less than his own. While few men have the moral and physical force to win the victory over adverse circumstances which this man won, his words may well inspire others who approach him in courage and natural power to strive for similar success.

December 21, 1892.

DEAR MR. BOLLES : —

I entered Harvard College with so poor a record that I received the maximum number of conditions. Professor Briggs afterwards told me that I passed so poor an examination in nearly everything that I was admitted because I came from a new school and was recommended as a faithful student. I had to take extra work, and I found the regular course was quite sufficient.

I had to rely *wholly* on myself to meet the expenses of my course in what many told me, was "the rich man's college."

I was \$116 in debt. When I left Boston for Cambridge I had forty-four (0.44) cents, so that my actual debt was \$115.56. I was a stranger in Cambridge. The first day I spent all but nine cents. I had one great help in this year, — \$250 from the Price Greenleaf Aid had been awarded me. This, however, I could not draw till Christmas. In order to buy books to begin my work, I pawned my watch and a few other things, receiving for the same \$15.50.

During my Freshman year my receipts were : —

RECEIPTS.		EXPENDITURES.	
Price Greenleaf Aid . . . .	\$250.00	Tuition . . . . .	\$150.00
Pawned watch, etc. . . . .	15.50	Room (heated and furnished)	50.00
Type writing . . . . .	71.40	Lighting above . . . . .	5.10
Books sold . . . . .	7.50	Books . . . . .	21.21
Tutoring . . . . .	1.60	Clothes . . . . .	15.00
	<u>\$346.00</u>	Board . . . . .	<u>140.00</u>
			\$381.31

This includes only necessary expenses. In addition I spent \$58.90, making my debt for the year \$94.21. Part of this year I was very poor. My washing I did myself. About mid-year I was so short of money that for nearly two months I ate but one or two meals a day. This was the hardest period of my course, but rather incited than discouraged me.

During the summer I worked as porter in a summer hotel. I strained myself quite badly, but I cleared \$118. I entered my Sophomore year \$91.77 in debt.

During my Sophomore year my receipts were:—

RECEIPTS.		EXPENDITURES.	
Loan fund . . . . .	\$75.00	Tuition . . . . .	\$150.00
Beneficiary funds . . . . .	80.00	Room, heating and lighting . . . . .	45.50
Work for Prof. James* . . . . .	4.50	Board at Foxcroft . . . . .	†93.43
Publishing notes . . . . .	25.50	Clothes and washing . . . . .	29.20
Waiting on table . . . . .	38.33	Furniture . . . . .	24.25
Type writing . . . . .	70.00	Books . . . . .	19.16
Outside jobs as posting bills, copying, etc. . . . .	52.15		\$361.54
	<u>\$345.48</u>		

My expenses this year were higher than necessary. I bought many books I did not need. I might have saved \$20 by hiring my furniture from the Loan Furniture Association.

In addition to the necessary expense I spent \$151.60 on athletics, theatre, unnecessary books, subscription to College sports, charity, and other interests. So my total expense was \$513.14. During the summer I earned above my expenses (as clerk in summer hotel) \$158.04. Thus during my Sophomore year I increased my debt \$9.62.

I entered my Junior year \$101.31 in debt. During my Junior year my receipts were:—

RECEIPTS.		EXPENDITURES.	
Scholarship . . . . .	\$150.00	Tuition . . . . .	\$150.00
Loan fund . . . . .	75.00	Room, etc. . . . .	49.50
Beneficiary fund . . . . .	15.00	Board at Foxcroft . . . . .	119.53
Odd jobs . . . . .	7.13	Clothes and washing . . . . .	51.73
Publishing placards . . . . .	18.10	Books . . . . .	24.38
Advertising scheme . . . . .	106.05		\$395.14
Tutoring . . . . .	267.50		
Type writing . . . . .	32.19		
Prof. James' work . . . . .	2.45		
Waiting on table . . . . .	16.11		
	<u>\$689.53</u>		

During the year I bought a type-writer for which I paid \$100. I also contributed towards the expense of some other fellows poorer than I, \$100. For incidentals I spent \$85.60. Then my actual expenditure this year was \$680.74. During the summer I clerked and earned above my expenses, \$100.50. I bought a good many books and so saved less than previously.

\* My work for Professor James was peculiar. It was taking sheep's brains from skulls for experiments in psychology.

† I was away from College five weeks.



I entered my Senior year out of debt and with \$7.90 on hand. This year my receipts were :—

RECEIPTS.		EXPENDITURES.	
Loan fund . . . . .	\$75.00	Tuition . . . . .	\$150.00
Beneficiary fund . . . . .	20.00	Room, etc. . . . .	56.40
Odd jobs . . . . .	18.99	Board . . . . .	160.00
Copying . . . . .	24.50	Clothes and washing . . . . .	43.32
Tutoring . . . . .	439.90	Books . . . . .	21.08
Advertising scheme . . . . .	72.39	Furniture . . . . .	32.00
Teaching school* . . . . .	14.00		<u>\$462.80</u>
Publishing notes . . . . .	24.00		
Type writing . . . . .	107.43		
Publishing books . . . . .	225.00		
	<u>\$1021.21</u>		

I spread Class-Day at an expense of \$100. I gave \$150 towards other students expenses. I hired a piano during the year, and added many books to my library, so that my "incidentals" amounted to \$149.60, making my expenses for the year \$612.40. Thus I saved during the year \$258.80, and graduated from College with \$266.70. I owed the College \$225 from Loan Fund, so that I was more than out of debt, or \$41.70 ahead.

I had bought a type-writer; increased my library by over 300 volumes; bought many useful articles; taken part in many branches of College life and work,—social, moral, athletic, literary, and religious. I played on one 'Varsity team, and on my class team in another sport. I found many openings for work for other fellows. Had I been able to do all I found to do, I should have made a good salary. I only tried to earn enough "to get through."

I graduated with my class *cum laude* and with courses to spare: also got Honorable Mention in one study. My health when I entered was very poor. I left College strong in body, better than at any time for ten years.

To sum up my four years' expenses :—

Freshman year . . . . .	\$381.31
Sophomore year . . . . .	361.54
Junior year . . . . .	395.14
Senior year . . . . .	<u>462.80</u>
For course . . . . .	\$1600.79

My Sophomore year is a fair estimate of what is actually necessary. I think if any fellow wished, he could save \$20 on furniture, and \$10 on books. . . . .

\* My teaching school was substituting in an East Cambridge school for a friend.

I cannot close without saying that my whole course was made easier by the friendly words of advice and encouragement from President Eliot, Professors Briggs, James. Smith, Peabody, Kittredge and Palmer, and not the least, from yourself.

Sincerely yours, ———.

This letter is only a part of a mass of evidence which shows that if a student in regular standing passes successfully through his first year at Harvard and proves himself to be upright in character, strong in body, and of unmistakable promise intellectually, the chances are against his being compelled to leave college on account of lack of money. When his course is finished such a man finds no great difficulty in obtaining a foothold in the outside world. A highly-recommended graduate of the College, or of any of the Professional Schools, as a rule finds himself given a fair chance to choose the part of the country in which he will accept an offer to enter upon his life work. The demand for Harvard graduates as teachers in both schools and colleges is in excess of the number of persons who can be cordially recommended by the University authorities. In various degrees the same is true of the demand for young men to enter the railway service, journalism, the publishing business, and other walks of life where a college training is of practical advantage. Every effort is made by the University to satisfy applications for the services of graduates, and every student of merit is encouraged to ask aid in securing the employment which he desires.

The following table illustrates the growth of the University during recent years : —

	1869-70.	1879-80.	1889-90.	1892-93.
No. of Professors . . . . .	41	52	71	86
“ “ Asst. Professors . . . . .	7	16	21	28
Total No. of Teachers . . . . .	81	150	217	294
Students in the College . . . . .	563	828	1,271	1,598
“ “ “ Graduate School	19	51	107	206
“ “ “ Scientific “	52	16	65	181
“ “ “ Divinity “	36	23	35	41
“ “ “ Law “	120	165	254	394
“ “ “ Medical “	306	251	290	451
“ “ “ Dental “	16	15	35	53
“ “ “ Veterinary “	—	—	20	39
“ “ “ Bussey Institution	—	7	2	6
“ “ “ Summer School	—	64	220	500
Total No. of Students* . . . . .	1,112	1,356	2,079	2,966
No. of books in the Library . .	184,000	253,000	371,000	412,000
“ “ pamphlets . . . . .	110,000	199,000	300,000	310,000
Amount of aid given . . . . .	\$25,000	\$38,000	\$77,000	\$89,000

\* Not counting students in the Summer School.

This table shows how uniform the development of the University has been during the past twenty years. The ratio of teachers to students is remarkably constant, every gain of a hundred students has apparently called for an increase of at least ten teachers, and the increase has come almost as punctually as the demand. In much the same way the number of books in the library has followed in its increase the gain in the number of students and teachers. The proportion in this case is one hundred and fifty new books to every new student, or fifteen hundred to every new teacher. Similarly the aid funds of the University have followed the demand for them. In 1870 the University distributed about \$22 in aid funds and prizes for every student on its rolls; now the proportion is fully \$30 per man. The proportion of men needing aid is believed to be greater now than it was twenty years ago, for the fallacy that Harvard is for rich men only is being effectively disproved.

The size of the professional schools corresponds closely to the national demand for highly educated professional men. The Schools of Medicine and Law are the largest; the Graduate School, which equips teachers for University work, is almost their equal; the School of Theology is small for the reason that the country still prefers to have its ministers trained in denominational schools, whether such schools are able or not, to having them trained in an unsectarian seminary. The Schools of Dental and Veterinary Medicine are of a size corresponding approximately to the public demand for their graduates, and it is to be observed that both of these schools have gained more rapidly than has the University as a whole. In thirteen years the Harvard Summer School has thrice doubled its numbers, enrolling 500 students in 1892 against 64 in 1879. The greater part of its students are teachers in public and endowed schools, academies, and colleges, who have the foresight and ambition to make use of the immense University equipment which is thrown open to them in months when less zealous or vigorous students and teachers are resting. The Summer School courses yield no degree, and as a rule are informal in their nature, but they are the only department to which women are as yet admitted, and they form the only regular exception to the general rule that work at Harvard must be continuous for an entire academic year, lasting from the close of September to the close of June. The University work is not cut into "terms" or "semesters," nor are courses so offered that a student can devote himself exclusively to a single study for one period of a few weeks, and to another study for a succeeding period. As a rule courses which begin in September last until June, and in most of the departments of the University candidates for a degree

must, under the rules, pursue four such courses side by side simultaneously.

The growth of Harvard in the last few years has been due in part to the steady increase in the number of graduates of other institutions who have come to it for advanced or professional instruction. The following table shows the rapidity and scope of this gain :—

HARVARD STUDENTS HOLDING DEGREES FROM OTHER INSTITUTIONS.

	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.
Yale . . . . .	17	17	12	19	16	30	31
Amherst . . . . .	9	11	16	18	21	19	28
Brown . . . . .	14	16	19	15	12	22	25
Bowdoin . . . . .	7	6	3	3	5	20	23
Other N. E. Colleges . . .	51	65	56	63	76	103	104
Middle States Colleges . .	27	21	39	29	42	54	46
Southern States Colleges .	18	19	15	22	21	27	49
Ohio, Ind. & Ill. “ . .	19	20	25	31	22	50	52
Northwestern “ . .	11	6	8	12	15	27	26
Western “ . .	3	4	6	9	23	18	35
Foreign “ . .	11	10	17	21	24	35	34

In 1886-87 Harvard contained 72 students from the South ; in 1892-93 it enrolls 174. In the same time the number from Ohio, Indiana, and Illinois has increased from 112 to 203 ; that from the Northwest, from 36 to 69 ; from the West and Pacific Coast, from 57 to 89, and from Canada, Japan and other foreign countries, from 30 to 83. It is a remarkable fact that of the seventy-four members of the present faculty of Arts and Sciences, no less than thirty-three are not Bachelors of Arts of Harvard College, and less than one half are Massachusetts men.

The matters considered thus far concern the University as a whole. It is now time to deal with separate departments, taking them up one by one in their natural order :—*first*, arts and sciences, or the departments of pure studies ; *second*, the professional schools ; and *third*, the scientific establishments, the libraries, the chapel, and the athletic buildings.



## ARTS AND SCIENCES.

The Faculty of Arts and Sciences has under its immediate instruction the students in Harvard College, the Lawrence Scientific School, and the Graduate School, whose numbers constitute two-thirds of the entire University. Courses of study offered by the Faculty of Arts and Sciences are divided into three classes: those intended primarily for graduates, those open to both graduates and undergraduates, and those intended primarily for undergraduates. It is common for unusually accomplished undergraduates to be admitted to courses intended primarily for graduates, in cases where no objection is raised by the instructor in the course.

At the present time, 10 seminaries and 339 separate courses of study are announced as open for election by students under this Faculty. A few of them are given in alternate years only. The following is a brief description of them under their appropriate heads. Most of them are "full courses," having three meetings a week throughout the year; others are half courses.

SEMITIC LANGUAGES AND LITERATURES. — Nineteen courses and a conference offered by two professors and two assistants.

"The aim of the department in the linguistic courses is four-fold. 1. To provide general students, especially such as intend to be teachers of language, with a knowledge of at least one member of the large and important family of languages known as Semitic. 2. To provide students who intend to become religious teachers with the Hebrew which is commonly required of them, so that the time spent in the Theological School may be made more fruitful. 3. To prepare students of literature to consult in the original the prose and poetical monuments of the Semites. 4. To offer to specialists a course of study which shall fit them to be teachers and investigators in the Semitic field.

"In the historical courses the aim is, in the first place, to present to the general student the leading facts in the national life of the Semitic peoples and to show what the Semites have accomplished for civilization; and, in the second place, to introduce specialists to the use of original sources. The object of the Biblical courses is to give that general acquaintance with the social-political, literary, and religious material of the Old Testament which every educated man should have, and further to conduct special investigations with those whose previous training fits them for this larger study."

The linguistic courses include two in Hebrew, one in Syriac, one in Jewish Aramaic, two in Assyrian, two in Arabic, one in Ethiopic, and one in Phoenician. The courses in history cover Babylonian-Assyrian history, that of Israel, of pre-Christian Hebrew literature, of the Hebrew religion, and of the Bagdad and Spanish califates. In addition courses in special research are offered to advanced students. The Semitic Conference meets twice a month. The department has a special library and reading-room adjoining its lecture-rooms. The Semitic Museum is described on a later page (see p. 93).

**SANSKRIT.** — Five courses and a conference offered by one professor.

“The courses in Sanskrit and Pāli address themselves on the one hand to students of the history of religions and philosophy, of social institutions, and of literature, and on the other to students of language. A knowledge of the ancient language of India is especially valuable for men who design to become teachers of the Classics, of German, or of English. The elementary course in Sanskrit may properly be taken in connection with any of the linguistic courses in Greek or Latin. In particular, it will be found a useful auxiliary to the study of the Greek dialects. Latin grammar, comparative philology of Greek and Latin, Anglo-Saxon, Gothic, Icelandic, and the older forms of German. The course in the Vedas and the course in Pāli offer an introduction to the religions of India; and a suitable collateral course is found in the lectures on the comparative history of religions.”

The courses include two in Sanskrit, one in the language and literature of the Vedas, and two in Pāli, the language of the sacred books of Buddhism. The conferences this year are occupied by a series of lectures upon India, its literature and antiquities, given in part at the University Museum and in part at the instructor's library. The University Library possesses about one thousand Sanskrit and Prakrit manuscripts — the largest collection of Oriental manuscripts in America.

**CLASSICAL PHILOLOGY: GREEK AND LATIN.** — Fifty courses and a seminary offered by seven professors, one assistant professor, and five instructors.

“Instruction for classical students now begins with a course, founded in 1891-92, entitled, *Introduction to Classical Philology*, consisting of forty lectures, with prescribed reading; the field is outlined and the students are guided to the books and receive hints as to methods of study. All the classical teachers take part in these lect-

ures. The highest course of instruction, open as a rule only to graduates of at least one year's standing, is the Classical Seminary, conducted by two directors annually chosen, who represent the Greek and Latin side respectively. A spirit of cordial coöperation characterizes the classical department, and this has led to organization and coördination in the courses of instruction. The courses are graded with due reference to the proficiency of students, and though not all are given every year, the more elementary ones are annually repeated, and the others recur after short intervals. They severally aim to realize leading ideas, and the methods of instruction naturally differ according to the controlling principle. Groupings may be made of courses designed mainly for developing the power of reading the languages; of courses for composition, written and oral, and for grammar as practically applied; of courses for reading the great authors, — some of these cover the entire works of an author (Aeschylus, Aristophanes, Homer, Catullus, etc.); of courses for the study of other branches of Classical Philology, — as ancient philosophy, political and literary history, religion, life and manners, art and archaeology, comparative philology, scientific grammar and dialects, epigraphy, palaeography, etc.; finally, of courses for research, in which miscellaneous topics are investigated.

“The instruction for graduate students is technical and special; the courses are professional in the sense that they aim to train teachers by first making sound classical scholars of them. They are in part courses of orientation, in part of exploration, and they teach methods of research by a combination of theory and practice. The resort of graduate students in classics to the University has distinctly increased of late. It is a noteworthy fact that, with one exception, the present twelve members of the Classical Seminary are Masters of Arts, and that several of them have taught in colleges. Not a few graduate students from other colleges are attracted to the more advanced courses designed for undergraduates, finding in them, even where the subject-matter is familiar, many new and enlightening points of view.

“Special courses upon methods of elementary Greek and Latin instruction, with lectures and practical exercises, are conducted by officers of the department in connection with the Courses for Teachers lately established by the Faculty of Arts and Sciences.

“As ought to be the case, most of the courses — those that most frequently recur, upon which the greatest stress is laid by the department — are the courses for the reading of authors from the point of view of literature. On the Greek side these courses are planned, first, to deepen and extend the new student's knowledge of Homer,

to introduce him to Attic oratory and the drama, and to acquaint him with the historic Socrates; then, in the Sophomore year, to continue and expand this work, separate courses being provided for students who cannot carry on their Greek beyond the second year, and for Honor candidates. In the reading courses designed for Juniors, Seniors, and Graduate students additional authors are taken up in their complete works, or in selected masterpieces.

“The idea of the present arrangement of Latin courses is to secure, first, some considerable facility in reading Latin. Ten years ago courses for this purpose were offered, but they stood apart from the others, as if a man might do good work in literature or in scientific investigation without facility in reading. Now, however, the whole of the entrance examination is directed to testing the candidate’s grasp of the language. In the Freshman year’s work the ordinary student is still further instructed in reading the language as a living one. Horace’s Odes, which require a great deal of outside illustration, are therefore reserved for later study, and Terence is used with Livy and Cicero in the first year’s work. Further opportunity for thus acquiring a grasp upon the language is offered in the first half of Latin 1 and 2. But for advanced students, even in the Freshman year, and for all in the second half of the next year, some literary study is provided. After this stage of advancement has been reached, half courses are open in Pliny’s Letters, Juvenal’s or Horace’s Satires, Catullus, Plautus, Lucretius, and the elements of Roman philosophy. Then the student passes from these, or such of these as he chooses, and takes more advanced work, such as the beginning of scientific investigation or a deeper knowledge of literature.

“It is an impression among the officers of the classical department, most of whom have been long in the service, that on the whole a greater proficiency is attained by students in Classics than was the case until lately. It is, at all events, a fact that the examination papers set for Final Honors (for Seniors and Graduates) fifteen years ago are now often found hardly searching enough for the Second-Year Honor examinations, and that the Second-Year Honor papers of the present day are in several particulars more difficult than were the old Final Honor papers. Students show a firmer grasp upon the language, a wider reading, and above all a more intelligent interest in their subject.

“Within two years the efficiency of the work of the department has been greatly promoted by the establishment of the classical department library, at present comfortably housed in two large rooms on the lower floor of Harvard Hall. One room is used for the



Seminary. The Library now contains over 3,000 volumes, comprising not only the more important books of reference, carefully chosen editions of all the classical authors, but also all books prescribed for collateral reading, as well as many of those needed in the courses of special research and in the Classical Seminary. The Library is open day and evening, and is abundantly used by both teachers and students. In the adjacent large lecture-room are kept an excellent oxyhydrogen lantern and a collection of over fifteen hundred photographic slides, intended mainly for use in the courses on Greek and Roman life and manners. The lantern is much used by instructors in subjects where the appeal to the eye can aid verbal description. There is other illustrative material in the same room, or elsewhere, — models of Tanagra figurines, a few casts of statues and reliefs (in part from the proceeds of the Greek play in 1881), maps and many photographs. The department owes the Library and the equipment of the lecture-room to several friends of classical studies, for the most part graduates of the College. By means of the income of a fund of \$6000, — the gift of members of the Class of 1856, — it has been possible to start and continue a department periodical publication, viz. : the *Harvard Studies in Classical Philology* (Ginn & Co., Boston), which is now in its fourth year. The *Studies* is edited by a committee chosen by the classical instructors, and contains original contributions to Classical Philology from instructors, students, and graduates, and occasionally from other persons."

ENGLISH. — Twenty-eight courses offered by three professors, two assistant professors, nine instructors, and six assistants.

"The department of English endeavors to teach (1) the origin and development of the English language and English literature, (2) the general history of English literature from the Elizabethan period to the present time, and (3) proficiency in English composition. (1) is taught in a series of eight courses, five of which lead through the formative periods of English prose and verse to the time of Chaucer. The remaining three courses deal with the text, the metre, and the literary history of the chief works of Chaucer, Shakspeare, Bacon, and Milton. (2) is taught in a series of nine courses, of which five treat English literature in outline century by century, one takes up Shakspeare in detail, one Wordsworth and the other master poets of the nineteenth century, one the Elizabethan drama, and one the Principles of Literary Criticism. (3) is taught in three prescribed courses covering the first three College years, and in three graded elective courses open to such men only as have shown some proficiency in English composition.

For maturer students, courses in special research are available."



GERMAN and GERMANIC PHILOLOGY. — Twenty-six courses and a Seminary offered by an associate professor, three assistant professors, and five instructors.

Ten of these courses aim to give a practical knowledge of the German language; eight others deal with German literature, art, and the history of German civilization; the remainder, constituting the courses in Germanic Philology and the Seminary, are devoted to the comparative study of Germanic languages and literatures.

The work in the courses of the first named group consists in the study of grammar, the reading of literary and scientific texts, translating into German, and writing of original themes.

The second group comprises courses on Lessing, Schiller, Goethe, the General History of German Literature, the Literature of the Middle High German Period, the Literature and Art of the Era of the Reformation, Literary and Aesthetic Criticism during the Classic Period, and the Political Tendencies in the Literature of the Nineteenth Century.

The courses of the third group deal with Gothic, Old Saxon, Icelandic, Historical German Grammar, Germanic Mythology, Germanic Antiquities, and the History of the Faust legend.

The Seminary, which is divided into three sections, the Old High German, the Middle High German, and the New High German, has two purposes in view: First, to make a thorough study of selected works with special reference to text criticism and (in the Old and Middle High German sections) to etymology and the history of grammatical forms; second, to acquaint the student with the methods of philological and literary research through original investigations carried on by him under the direction and supervision of the instructor. The results of such work are discussed in each section and may be presented at some meeting of the Modern Language Conference toward the end of the year. The exercises take place once a week in each section and generally last an hour and a half.

FRENCH. — Fourteen courses and opportunities for special research offered by one professor, two assistant professors, and three instructors.

The courses in this department are divided into three groups. Those in the first group are offered primarily to undergraduates. Their main object is to give to the student a grammatical and a practical knowledge of the French language, and to form an adequate introduction to the study of French literature. By a practical knowledge of the language is meant ability to read French readily without trans-

lating, ability to understand with ease spoken French, and ability to use the language both in speaking and writing. The last of these, especially the speaking, is necessarily limited by the number of students in college classes; but ability to understand the spoken as well as the written language is secured by the fact that all the courses are conducted in French. The courses included in the second group are offered both to graduate students and to advanced undergraduates. Their object is twofold: first, the acquisition of a more perfect knowledge of the language than can be obtained in the courses of the first group; second, the systematic study of French literature. The courses included in the third group are offered primarily to graduate students, but duly qualified undergraduates are admitted to them. They comprise the study of Old French and of the literature of France during the Middle Ages, and courses in which students are trained to investigate special topics in French literature." Courses in Old French, Provençal, and Low Latin are given in the department of Romance Philology which is described on the next page.

ITALIAN, SPANISH, ROMANCE PHILOLOGY, AND COMPARATIVE LITERATURE. — Nineteen courses and opportunities for special research, offered by two professors and two assistant professors.

There are four courses offered in Italian and four in Spanish.

"The courses, 1, 2, and 3 in Italian, and 1*a*, 2, and 3 in Spanish, have been planned with the intention that, at the close of the third course, a student who began course 1 without any previous knowledge of the language shall be able, (1) to pronounce well; (2) to read literary works, both ancient and modern, with understanding and enjoyment, without translating them; (3) to translate ordinary English prose into idiomatic Italian or Spanish, with some aid as to vocabulary; (4) to understand ordinary conversation in Italian or Spanish; (5) to express his own thoughts fairly well in Italian or Spanish; and (6) that he shall have become acquainted with some of the best writers from the earliest to the present time and, in a general way, with the history of the literature from its birth to our day. Whether these objects (or those of the several courses) shall be attained must depend largely on the student's earnestness of purpose and his corresponding diligence in the work."

The courses Italian 3 and Spanish 3 are conducted chiefly in Italian and in Spanish respectively. For students wishing but a single year in Spanish, whether for philological or for practical purposes, the course Spanish 1*b* is offered. Course 4 in Italian is a special advanced course on Literature and the Fine Arts in Italy during the

Middle Ages and the Renaissance, Dante's life and times being particularly studied.

A student who, after acquiring a fair knowledge of Italian and Spanish, desires to study the historical development of the Romance languages will find the courses in Romance Philology suited to his needs. These courses are seven in number, as follows: — Phonetics: Old French, Phonology, and Inflexions; Provençal, language and literature, with selections from the poetry of the Troubadours; Low Latin: Old French dialects with special reference to Anglo-Norman; the French element in English.

For students desiring to learn the mutual relations of modern European literatures, especially in the Romance countries, four courses in Comparative Literature are offered. They are as follows. The history of classical learning in Europe from the fifth to the fifteenth century, considered with regard to the relation of modern culture and education to classical literature; comparative European literature in the Middle Ages, with special reference to the influence of France and Provence; the origin and development of historical epic poetry in mediæval Europe: the legendary and poetic material of Celtic origin and its treatment in the narrative poetry of the Middle Ages.

In order to promote advanced study and research in the modern languages and literatures, and to bring together instructors and students engaged in the various branches of modern Philology, the departments of English, German, French, and Romance Philology have established a modern language conference. The conference meets from time to time throughout the college year for the presentation and discussion of papers of general interest.

**PHILOSOPHY.** — Twenty-one courses, including Psychological, Metaphysical, and Ethical seminars, offered by six professors, one assistant professor, one instructor, and three assistants.

The courses of this department fall into four groups. A single course in the first group furnishes a preliminary acquaintance with the subject of Philosophy as a whole. In it lectures are given by various members of the department upon Logic, Psychology, Metaphysics, and the History of Philosophy.

In the second and third groups courses of an advanced character are placed. They are open to undergraduates and graduates alike; but they can be taken only by those who have already completed course 1, or who are able otherwise to show that they possess satisfactory knowledge of the subjects there studied. Between the two groups there is no difference of severity, nor is one of a more ad-

vanced character than the other. They differ merely in method. In the second group are to be found courses in Psychology, Cosmology, Ethics, and the Ethics of Charity, Divorce, Temperance, and Socialism. In these courses each lecturer expounds his own beliefs and sets forth in systematized order the doctrine of his subject. In the third group the more important periods in the history of philosophy are critically interpreted, as for example: Descartes, Spinoza, and Leibnitz; English philosophy from Hobbes to Hume; Kant and Fichte; studies in the comparative histories of religions; the development of ethics in England. Which one of these groups, or which single study within a group, shall be chosen first is determined by the taste and aims of the individual student.

The fourth group is intended for graduate students exclusively, especially for teachers. While certain courses of research are definitely marked out, individual needs are also considered. Seminars are held, laboratory investigations undertaken, or the student selects for himself a topic and without confinement to fixed hours carries on his work with continual aid from a supervising professor.

The following enthusiastic description of the apparatus in use in the psychological laboratory gives some idea of the character of the work undertaken in the research courses of this department.

"A stroll through the workrooms, even outside of working hours, permits one to see clearly this high development from a glance at the apparatus stored in the glass cases. Four great groups of contrivances can thereby be easily distinguished. First, the apparatus intended to illustrate the relations between mind and body through representations of the brain, nerves, sense-organs, etc. Costly models of brain, eye, and ear, all with detachable parts, valuable models of nerve paths, fine preparations in wax, dissected parts in alcohol, etc., — all are here. Here belong also the anatomical diagrams and the histological nerve-preparations with excellent microscopes. All this has significance for demonstration only, and accordingly has nothing to do with the experimental problems proper. The three remaining sections are for that.

"In extent the section for the psychology of the senses is by all means the most imposing. Eye and ear have equal recognition. A copious collection composed of tuning-forks, an organ, a harmonical, pipes, resonators, etc., etc., serve for psychological acoustics. Color-mixers of various sorts, costly prisms, apparatus for after-images and color-blindness, a dark room, perimeters, etc., serve for psychological optics. And yet the lower senses are not forgotten. Complicated touch and temperature apparatus, and instruments for the study of sensations of movement and pressure belong as well to the list.



"Of greatest value is the incomparably rich collection of instruments belonging to the third section. They serve for the time-measurement of psychical acts, from the simplest impulses to the most complicated processes of judgment. Here the methods used gain constantly in value. They allow us to estimate most minutely distinctions which are inaccessible to self-observation, and the more their resources are developed, the deeper the glance we gain into the structure of the mental organism. Our clocks have somewhat the same function as the microscopes of the anatomist. With his microscope he can distinguish the thousandth part of a millimeter; with our chronoscope we can measure the thousandth part of a second. But every question craves new contrivances, and so, together with our valuable clocks, we find the best kymographs, instruments for reaction, and registering tuning-forks of every sort. In this section almost nothing is left to be desired.

"In the fourth section is included all that apparatus which serves exclusively for the investigation of higher mental processes, such as the perceptions of space and time, memory and attention, association and formation of judgments, discrimination and fusion. These stand in the foreground, but feelings and emotions, impulses and acts of will, are also accessible regions. Right here the newest instruments show their power. Apparatus for the study of aesthetic feelings or the expression of the emotions, and much that is similar, has just now crossed the ocean. It is exactly in this department that the tiny mechanical workshop of our laboratory has proved most useful. Copious supplies of wood and glass, of brass and cotton wadding, of all varieties of paper and iron tools, of wires and tubes, and of physical and chemical paraphernalia, enable us continually to adapt the instruments to our questions. Such is our laboratory after an expenditure of over four thousand dollars, equipped in the best possible manner for the carrying on of its difficult questions."

Three courses offered under the department of Philosophy are on EDUCATION AND INSTRUCTION. They cover the history of educational theories and practices, the organization and management of public schools and academies, and the theory of teaching. These courses were established for teachers and persons intending to become teachers. They are offered to men who are graduates of colleges or scientific schools and to other persons of suitable age and attainments under the same conditions as those which govern admission to the Graduate School. At first these courses could not be counted toward a degree, but recently it has been decided to place the courses on the history and theory of education, and the course on supervision,



organization, and management of schools, among the regular college electives. Henceforth, they may be counted for a degree in Arts, and, under certain restrictions, they are offered to graduates and undergraduates alike. This was done in recognition of the great value of the study of education to all college students, as well as of its special importance to those who intend to become teachers.

“Two classes of discipline are provided: —

“I. The future teacher needs to become a student of mind through Psychology, and then, having learned to observe how intelligence develops, how knowledge is acquired, and how character is evolved, he formulates the general principles of a method of teaching in harmony with these processes. He then studies the application of these principles in the actual work of successful teachers. Accordingly the psychological basis of method is one of the special topics in the course in theory. For the application of these principles, students have an opportunity to study the special methods of teaching the several academic subjects through a series of short courses on the teaching of Greek, Latin, German, French, English, history, mathematics, physics, chemistry, botany, geology, zoölogy, and geography, given by representatives of the corresponding departments in the college. Through the courtesy of school officers and teachers our students are also permitted to study the teaching in the schools of Cambridge, and of other cities in the vicinity of the University, and this opportunity of direct contact with instruction in the schools is highly prized.

“II. But the student needs to widen his educational horizon. He needs to look upon existing school systems in the light of their historical evolution and in the light of comparative study. To this end, two courses of study are provided: first, a course in the History of Education which makes the student acquainted with the educational ideals of the past, and their effect upon the development of the individual and of society; and second, a course on the Organization, Management and Supervision of Public Schools and Academics.

Prepared by his historical study, and by his study of psychology and of method, the student of education and teaching is ready to study present theories, systems, and practices, so as to make a just estimate of their value. The course on organization, management, and supervision obliges the student to bring to bear all his previous training upon a comparative study of our city and State school systems (not less than three different city and three different State school systems are examined), and upon the school systems of England, France, and Germany. So far as American city systems are concerned, this course is again illustrated in part by the systems

of the cities in our immediate vicinity, which our students have an opportunity to study in actual operation."

**HISTORY AND POLITICAL SCIENCE.**—Forty courses and four seminaries offered by five professors, three assistant professors, and five instructors.

The courses in this department are classified as courses in History, in Government and Law, and in Economics. Each of these groups has at its foundation an introductory course designed to prepare the successful student for later specialization. In History this introductory course in mediaeval and modern European history is followed by separate courses covering Roman history to Diocletian; the Middle Ages; western Europe from the Germanic invasions; first eight Christian centuries; era of the Reformation; France to Louis XIV.; constitutional history of England; American history to 1783; political history of the United States, 1783–1865; American diplomacy, etc. These epoch courses are followed by instruction intended primarily for graduates, and including the following: early mediaeval institutions; sources and literature of English constitutional history; geographical discovery in North America; elements of Latin paleography, and seminaries in mediaeval history; modern history and diplomacy; and in American history and institutions. In Government and Law an elementary course in constitutional government is followed by courses on the elements of international law and the history of European diplomacy; the history and institutes of Roman law; Federal government; history of political theories; political methods in the United States; historical development of international law; advanced course in Roman law; and other courses of kindred character. In Economics an introductory course, conducted by two professors and two instructors, leads to two groups of more advanced courses. In the first group, which is concerned chiefly with economic and social theory, are three courses. The first of these traces the development of economic theory from Adam Smith to the present time, and considers the present stage of economic theory with special reference to distribution. Lectures are varied by the discussion of selections from the *Wealth of Nations*, and from Malthus, Ricardo, Henry George, Walker, Sidgwick, and others. The second deals among other topics with the following: the economic ideas of the ancient world; the theories of Plato and Aristotle; the teaching of the early and mediaeval church; the canonist doctrine; the theory of usury; the appearance of modern economic ideas at the Renaissance; mercantillism in its earlier and later forms; the beginnings of statistical science; the school of the Physiocrats; the English writers

from Child to Hume. Students in this course must be able to read German readily. The third course is on the Principles of Sociology and gives a comprehensive view of the structure and development of society in relation to some of the more characteristic ethical and industrial tendencies of today. This course illustrates the connection between Economics, Philosophy and Ethics, and Social History.

The second group of advanced courses contains courses of a more historical and practical character, in which the intellectual training, while consisting in part in logical deduction from principles, is derived largely from the collection of evidence, the weighing of *pros* and *cons*, and the use and understanding of historical and statistical material. The special topics taken up in the six courses of this group are railway transportation; tariff legislation in the United States; financial legislation in the United States; theory of methods of taxation; financial administration and public debts; banking and the history of the leading banking systems; the social and economic condition of workingmen in the United States and other countries; and the economic history of Europe and America down to 1763. A more detailed description of the last-named course serves, in a way, to indicate the nature of the instruction in this group. It takes up in order the following subjects: "the scope and purpose of economic history; the agricultural and industrial organization of the Roman Empire,—the *villae* and *collegia*; the tribal system of the Celts, Teutons, and Slavs; the problem of the origin of the manor; the manor in its complete form, and its subsequent transformation; the rise of commerce and industry, and the history of merchant guilds and craft guilds in relation thereto; the organization of international trade in the Middle Ages; the agricultural changes of the sixteenth century in England and elsewhere; the great trading companies; the woollen trade of England, and the domestic system of industry; the agricultural reforms of the eighteenth century; the history of public poor relief; the history of the currency; the rise of modern finance." In the seminary of this department subjects are assigned to advanced students, in accordance with their rank and preparation, for special investigation.

Four of the Fellowships assigned in the Graduate School have special reference to political and economic studies, namely: the HENRY LEE MEMORIAL FELLOWSHIP (income \$450), for the study of Political Economy; the ROBERT TREAT PAINE FELLOWSHIP (income \$500), for the study of Social Science; the HENRY BROMFIELD ROGERS MEMORIAL FELLOWSHIP (income \$450), for the study of Ethics in its relation to Jurisprudence or to Sociology; the OZIAS GOODWIN MEMORIAL FELLOWSHIP (income \$450), assigned to students of Con-

stitutional or International Law. The departments of History and Political Economy are particularly well equipped as regards libraries. Not only is the central library in Gore Hall remarkably rich in materials for research in these departments, but four separate class-room libraries, — two in history, one in economics, and one in sociology and ethics, — place in the most readily accessible order the books most in use by students and instructors.

**FINE ARTS.** — Four courses and opportunities for special research, offered by a professor and an assistant professor.

The instruction in this department divides itself naturally into two groups. In the first group are courses on the principles of delineation, color and chiaroscuro, and on the principles of design in painting, sculpture, and architecture. In both courses lectures are supplemented by collateral reading and by practice in drawing and in the use of water colors. The second group contains historical lecture courses on ancient art and on Roman and mediæval art. Advanced students are enabled to pursue special studies in the history of Fine Arts. This department will soon occupy its new quarters in the William Hayes Fogg Art Building to be built in the College yard.

**MUSIC.** — Six courses offered by one professor.

These courses provide thorough training for students who intend to follow music as a profession either as teachers or composers, and they also offer a course of technical study to those who wish to devote themselves chiefly to musical criticism and literature, or to the cultivation of musical taste.

The first course is in Harmony. The fundamental principles of the theory of music are embodied in the study of harmony, which treats of the different chords in their natural relations and combinations. The subdivisions of the subject are as follows: Intervals, or the measurement of the distance from one tone to another; Triads and Seventh chords with their inversions and resolutions; Chromatically altered chords; Cadences; Suspensions; Passing and Changing-notes; Organ-point; Harmonization of given melodies, or the application of chords to the accompaniment of a *cantus firmus* in four-part writing; Modulation. The second course is in Counterpoint, which applies the principles of harmony to the melodious treatment of the several voice-parts in combination. The art of musical composition begins properly with this study. The work consists principally of written exercises on given themes in the following order: Chorals and melodies harmonized, using passing notes freely; the several orders of Counterpoint in two, three, and four voices, with the *cantus*



*firmitas*; Double Counterpoint; Free Imitative Counterpoint; Inventions in two voices. The third course is in Canon and Fugue, which are the most advanced and difficult forms of strict composition, and require a thorough knowledge of harmony and counterpoint. The work consists mainly of the composition of two-part Canons in similar and contrary movement, with different intervals; canons with free accompanying voices, etc.; fugues in two and three voices. A part of the time is given to forms of free instrumental music. The fourth course is in Free Thematic Music, and aims to give a knowledge of musical form (or thematic construction) so essential to the thorough understanding and appreciation of the works of the great composers, as embodied in their symphonies, overtures, chamber music, and sonatas. A course in the History of Music traces the gradual development of music from ancient to modern times. It gives the history of Gregorian church music; the origin and development of the modern scales and counterpoint; the choral music of the Flemish and Italian masters of the 15th and 16th centuries; history of the opera, cantata, and oratorio; instrumental music with the development of the present classical forms of composition as represented by the great masters; musical instruments, ancient and modern. A course in Instrumentation, open only to advanced students, concludes the series.

The student of music at Harvard has great advantages offered him for the cultivation of his taste by the numerous concerts given in Boston and Cambridge. The University Library, with its 412,000 volumes, is intended to possess all books required for reference by students in music. The library contains the complete editions of the scores of Palestrina, Handel, Bach, Mozart, Grétry, Beethoven, Schubert, Schumann, Mendelssohn, Chopin, and Wagner, and the principal scores of all the great composers. The library is also rich in books on musical theory, history, biography, criticism, and aesthetics. If a book needed by a graduate student is not found in the library, it will usually be ordered. The books which bear most directly upon any given course are placed together on special shelves, lettered with the name of the Instructor. In drawing books, three volumes may be taken at a time and may be retained a month; but additional facilities are afforded students who are carrying on special lines of research.

**MATHEMATICS.**—Twenty-eight courses and a seminary, offered by four professors and three instructors.

Six of the courses given in this department are elementary in character and cover the following subjects: algebra, solid geometry, ana-



lytic geometry, plane trigonometry, and spherical trigonometry. The higher courses may be classified as *intermediate*, *advanced*, and *courses of research*. The intermediate courses include differential and integral calculus; modern methods in geometry; determinants; and the elements of mechanics. The advanced courses and courses of research include among other subjects: quaternions; general theory of the algebraic curves; analytic mechanics; trigonometric series; introduction to spherical harmonics; potential function; the theory of equations; the theory of functions; higher algebra; hydro-mechanics; wave motion; problems in the mechanics of rigid bodies; the elliptic functions; the theory of substitutions; functions defined by differential equations; curvilinear coördinates and Lamé's functions; qualitative algebra and the algebra of logic. One of the principal objects of the seminary is to give students instruction in preparing and delivering lectures on topics not usually treated in any of the regular courses.

ENGINEERING. — Seventeen courses offered by one professor, one assistant professor, and six instructors.

The courses offered include the following: practical astronomy, determination of time, latitude, and longitude, use of the sextant and astronomical transit; mechanical drawing; surveying, plotting, and topographical drawing; stereotomy and machine drawing; construction and maintenance of common roads; railroad surveying; rational mechanics and graphical statics; resistance of materials as used for structural purposes; hydraulic and wind motors; general theory and efficiency of machines, steam-engines, and pumping-engines; water supply and sanitary engineering; bridges and buildings; masonry and timber structures and foundations; dynamo electrical machinery; industrial applications of electricity.

“Those courses which represent the essential portions of the professional occupations of civil, topographical, mechanical, and electrical engineers are required in the work of every student in the department. These essential subjects are supplemented by such elective courses as the future technical work of the student, or the natural trend of his capacities or talents may indicate as most useful for him. There is thus offered to young men who desire to attain an education in engineering not only the most advanced technical training in the general and special fields of engineering work, which may give them control of all branches of design, construction, and operation, but also instruction which may aid in developing their executive capacity, and prepare them to originate and construct, in the progress of their professional career, those engineering enter-

prises which play important parts in the development of the material resources of the country. The method of instruction is that of lectures and conferences supplemented by demonstrations by the students in such portions of the various engineering subjects as are best adapted to that mode of treatment. Laboratory work with testing machines, dynamos, motors, and other special machines is required at all available points in the courses of study. Field work with surveying and geodetical instruments is made a prominent feature in the students' operations. The resulting notes and data are carefully worked up and preserved, and maps, plans, sections, etc., made from them precisely as in actual engineering operations. Frequent visits of inspection and observation are made to engineering works (including those of electrical engineering) in process of construction and operation, for which the vicinity provides unusual facilities."

**PHYSICS.**—Thirteen courses, including those of research, offered by two professors, one assistant professor, two instructors, and four assistants.

The courses in Physics are naturally separable into three groups. In the first group fall two courses in experimental physics, covering measurements in mechanics, sound, light, heat, electricity, and magnetism, and a course in general descriptive physics. In the second group are placed courses in electrostatics, electrokinematics, and electromagnetism; electrodynamics and magnetism; light, a general treatment of optical phenomena; thermodynamics; and in heat engines. The third group contains courses on the mathematical theory of electrostatics and electrokinematics; on the mathematical theory of electrodynamics, magnetism, and electromagnetism, and special research courses on spectrum analysis, mathematical physics, and electromagnetism and heat conduction.

"Unusual facilities are offered in the elementary laboratories, which occupy the east end of the Jefferson Physical Laboratory building, for obtaining a knowledge of Physical Science. Especial attention has been paid to the construction of laboratory apparatus suitable for instruction, and the courses are believed to have a logical sequence. A large lecture room, seating over 300, is provided with apparatus for modern methods of projection, and with those facilities for illustration which steam at high pressure, oxygen and hydrogen gases, and alternating and continuous currents of electricity permit. The west end of the building is devoted to physical investigation and to the advanced work of graduate students. The method of construction permits an entrance to each room from a central corridor, and

thus obviates intrusion upon delicate work. The rooms in the western end are provided with piers, and the pipes and metallic work are of brass, to prevent as far as possible magnetic disturbances. The building is very favorably situated for scientific investigation, being in a quiet neighborhood, at a distance of three or four hundred feet from the nearest street."

CHEMISTRY. — Seventeen courses, including five of research, offered by three professors, three instructors, and eight assistants.

An elementary lecture course in Chemistry is prescribed for all Freshmen in Harvard College. Following, or supplemental to this, is a course in experimental chemistry of an introductory nature, and this in turn is followed by a course in general descriptive chemistry, including its application in the arts and embracing the scheme of the chemical elements. Three regular courses in mineralogy are offered by this department: one in the mineralogy of common rocks and metallic ores, with blowpipe and furnace assaying, one in systematic mineralogy, and one in crystallography and the physics of crystals. Two courses are offered in quantitative analysis and one in qualitative. Among more advanced courses are those on the carbon compounds: chemical philosophy: problems in inorganic chemistry and chemical physics. The courses in research given this year are in the determination of atomic weights, aromatic compounds, organic chemistry, inorganic chemistry, and in advanced mineralogy.

Besides the research work which is being carried on by the instructors, twelve advanced students, some of whom are also assistants, are conducting various original researches, the more important results of which will be published. One professor and his assistants are continuing the study of the derivatives of tribromdinitrobenzol, as well as of turmerol and other products obtained from tumeric. Another, assisted by several graduates, is devoting much time to the study of the derivatives of methyl pyromucic acid, which was discovered by him not long ago. Another, with several graduate students, is working upon atomic weights: four of the instructors are revising the atomic weights of barium, strontium, and calcium: and another, that of Bismuth.

The laboratories of this department contain over 250 working tables, more than half of which are occupied by two students each, having separate lockers and working at different hours.

In the mineralogical laboratory the instructor and his assistant are engaged in the analysis of minerals and in studying the constitution of meteorites.

**BOTANY.** — Six courses, including two of research, offered by two professors and one assistant professor.

The instruction in this department includes an elementary lecture course with laboratory drill; a course on the morphology of plants, which is closely associated with a corresponding laboratory course in zoölogy; an advanced course in general botany with laboratory practice; a course in cryptogamic botany; and two research courses on the structure and development of phanerogams, and of cryptogams, respectively. The work of this department is intimately connected with that of the Gray Herbarium, the Botanic Gardens, and the Botanical Museum. Abundant material for laboratory work is supplied by the Botanic Gardens and the Bussey Institution. The phanerogamic laboratories in the Botanical Museum accommodate 125 students at one time. The department of Botany has, in the Nathaniel Cushing Nash memorial lecture-room, the finest class-room in the University. It has the height of two stories; its seats are arranged as an amphitheatre and each has a movable desk attachment. The room is equipped for lantern projections and demonstrations.

**ZOÖLOGY.** — Eight courses, including those of research, offered by two professors, two instructors, and three assistants.

The courses begin with an introductory course in general zoölogy in which the time is divided between topics connected with the morphology and distribution of animals, and an outline of human physiology. Lectures are supplemented by laboratory work. The second course is on the morphology of animals and must be taken in connection with its complementary course in botany. More advanced courses cover the comparative anatomy of vertebrates; microscopical anatomy; and the embryology of vertebrates. Research courses are offered in the anatomy and development of animals; general entomology; and comparative osteology. The investigations of advanced students taking these courses are usually printed in the Bulletin of the museum.

“All zoölogical courses are conducted in the natural history laboratories, and the work under the museum assistants is carried on in the adjoining Museum of Comparative Zoölogy, which was founded by Professor Louis Agassiz in 1859. The formal instruction by lectures and laboratory work on anatomy, histology, and embryology is conducted in rooms on the fourth and fifth floors in the northwest section of the Museum. Places for work upon the museum collections are provided in connection with the rooms of the several museum assistants. There are a large number (17) of such rooms where specialists may work under proper restrictions, and have easy



access to the collections, which have all been arranged with a view to facilitating special investigations. The fifth-floor lecture-room has a floor space of 2260 square feet and seats about 250 persons; it has thirteen north and west windows, and is provided with work-tables and microscopes for classes in sections of about 25 each. A room on the fourth floor corresponding in position and size to the lecture-room above is provided with work-tables to accommodate about 40 students. It is also used as a lecture-room, having seats for a class of 75. The laboratories flanking the one last mentioned have each five windows. A large room having a west exposure is for class work in histology and embryology; it has a floor space of 1200 square feet, and is furnished with the needed apparatus for advanced microscopical work. A room with north exposure is used exclusively by persons carrying on original investigations in the anatomy and development of animals; it is equipped with the modern appliances for such work. There are a large series of diagrams (1300) and several cases of anatomical preparations in the laboratories and adjacent halls, as well as an extensive collection of embryological models, which are used in the illustration of lectures.

The books which are most needed in connection with class instruction are in both the Museum Library and the Library of the Zoölogical Laboratories. The latter at present contains about 200 volumes. Besides the zoölogical memoirs embraced in the transactions of learned societies, which are largely stored in the College Library, the Museum Library contains over 23,000 volumes and half as many pamphlets on zoölogy and palaeontology. It therefore rarely happens that any one engaged on a special topic of research fails to find at his command all the literature on the subject; and in such an event the desired works, if not at hand, are usually included in the regular orders for the increase of the Museum Library. The reading tables of the Museum Library, on which the current periodicals in zoölogy, palaeontology, and geology are arranged as soon as received, occupy a space 9 feet wide by 170 feet long, and are lighted by twenty-two windows. The collections of the museum are in charge of museum assistants, who, at the discretion of the director, afford opportunities for study to persons fitted to make intelligent and proper use of the material. The collections, having been made for the purpose of aiding in the advancement of science, are accessible only to persons who are already capable of making the best scientific use of them."

**GEOLOGY.** — Sixteen courses, including six of research, offered by three professors, one assistant professor, one instructor, and six assistants.



The instruction given in these courses includes the subjects of geology, physical geography and meteorology, petrography and palaeontology. There are courses for beginners in meteorology, physical geography, and elementary geology. Courses open to both graduate and undergraduate students include general critical geology, structural and dynamical geology of the stratified rocks, petrography, paleontology, historical geology, and economical geology. Courses usually open only to graduate students cover advanced geological field-work, selected topics in physical geography and meteorology, petrographical research, an advanced course in paleontology, mineral veins and metalliferous deposits, geographical methods and results. Advanced students meet the instructors weekly in the Geological Conference. Frequent field-work expeditions are led by members of the department to quarries, cuttings, beaches, and other points of geological interest in eastern New England. The laboratories and lecture-rooms exclusively occupied by the department of geology form one of the most important sections of the University Museum, and their equipment is ample for present purposes.

**AMERICAN ARCHAEOLOGY AND ETHNOLOGY.** — A course of special training, requiring three years for its completion, offered by one professor.

The work in Archaeology is carried on in the Peabody Museum of American Archaeology and Ethnology, where laboratories and ample collections afford abundant space and material for study. Promising students are, in the later part of their course, kept employed in the field either in Honduras or other localities where exploration is in progress. In the year 1892-93 the World's Columbian Exposition dictates the occupation of all members of this department. In order regularly to enter this course of study, the candidate must be a graduate student and have a knowledge of chemistry, geology, botany, zoölogy, drawing, surveying, French, and Spanish.

**ANATOMY, PHYSIOLOGY, AND PHYSICAL TRAINING.** — Six courses, offered by an instructor and the director of the Hemenway Gymnasium.

These courses are offered primarily for students of the Lawrence Scientific School, and can be counted for the degree of S.B. only. They are as follows: elementary physiology and hygiene of common life; history of physical education; physiology of exercise; anthropometry; measurements and tests of the body; effect of age; nurture and physical training; applied anatomy and animal mechanics; remedial exercises; the correction of abnormal conditions and posi-

tions. Students working in the physiological laboratory study the various digestive and respiratory processes: determine the character of the chest and abdominal respiratory movements when at rest, when exercising, when fatigued, and when singing or talking; study muscular contraction by means of the plethysmograph; determine the changes of blood-supply in relation to muscle, exercise, and fatigue: and devote themselves to other similar problems and processes. All the apparatus used in this laboratory is contrived and made expressly for it. The photographic outfit of the laboratory is ample to enable it to secure in a series of years a very valuable series of pictures of athletes in the various phases of their exercises.

The students enjoying the courses of study just described are undergraduates in Harvard College, members of the Lawrence Scientific School, members of the Graduate School, and special students in the College. It is not uncommon for most of the professional schools to have representatives in courses in Arts or Science which bear more or less directly upon their professional study. Such resort to these courses by members of the professional schools is encouraged by all faculties concerned.

The several departments in charge of the Faculty of Arts and Sciences should now be considered in order, as follows: Harvard College, the Scientific School, and the Graduate School.

## HARVARD COLLEGE.

Of the three departments under the Faculty of Arts and Sciences the College is the oldest and largest. It has a high standard for its degree of Bachelor of Arts. Few, if any, other American colleges equal it in this particular. This fact is shown by the requirements for admission and graduation, as stated in the University Catalogue, and exemplified by the examination papers on admission requirements and on college studies. A large number of high schools and academies are unable to fit their pupils for Harvard College; and many of the preparatory schools find it necessary to provide extra instruction for pupils intending to enter here. Finally, students coming to Harvard from another college seldom find it for their interest to enter at the same grade which they held at the college from which they came. Entrance *ad eundem* can, however, always be obtained by passing the required examinations, and it is sometimes granted without examination to students who have gone temporarily to another college and have maintained there a specially high rank. The following table, which gives the percentage of candidates who failed in the final examinations in a recent year, indicates the severity of the marking at the admission examinations.

ELEMENTARY STUDIES.		ADVANCED STUDIES.	
English . . . . .	17	Greek . . . . .	8
Greek . . . . .	15	Latin . . . . .	17
Latin . . . . .	11	Greek Composition . . . . .	29
German . . . . .	56	Latin " . . . . .	13
French . . . . .	19	German . . . . .	28
History (Ancient) . . . . .	29	French . . . . .	17
" (Modern) . . . . .	32	Logarithms and Trigonometry .	35
Algebra . . . . .	23	Solid Geometry . . . . .	25
Plane Geometry . . . . .	30	Analytic Geometry . . . . .	29
Physical Science (Descriptive) .	53	Advanced Algebra . . . . .	43
Physics (Experimental) . . . .	18	Physics . . . . .	14

Although the Harvard standard is thus seen to be exceptionally high, the requirements for admission are much more elastic than those which prevail in most other places. The simplest form of the requirements calls for a special knowledge of English, Greek, Latin, German, French, history, algebra, plane geometry, and physics, together with advanced preparation in two subjects chosen from the languages already named, mathematics, and physical science. But if a candidate prefers to omit either Greek or Latin, and either French or German, he may do so on condition of passing (under certain

restrictions in the case of Greek or Latin) in an additional number of advanced subjects. Moreover in history he has a choice between American and English history and the history of Greece and Rome; and in physical science between elementary physics and astronomy learned from text-books only, and experimental physics learned in the laboratory. In elementary Greek, Latin, German, and French he is not tied to any particular authors, but is asked to show his ability to translate simple prose passages at sight. In English he is required to write a composition upon a subject taken from one of several specified books, most of which — if he has literary taste — he has probably read before being required to do so. Japanese candidates may under certain conditions substitute Japanese for English, Chinese for elementary Greek, and English for elementary Latin. For an exact statement of the existing requirements for admission the candidate should invariably consult the University Catalogue, but the following details may serve to give an idea of what a Harvard student is expected to learn before entering College.

### *Elementary Studies.*

ENGLISH. — The first part of the examination in English is based upon selected works of standard English authors. The list of books changes from year to year, the announcement of the changes being published several years in advance. The student should read the prescribed books as he reads other books; he will be expected, not to know them minutely, but to have freshly in mind their most important parts. He may be asked to write an outline of a specified novel or to explain the purport of an essay.

Whatever the subject of the composition, the examiner will regard knowledge of the book as far less important than ability to write English. The student should therefore have constant practice in writing, and should test his work severely. He should spell correctly and punctuate intelligently. He should make sure — so far as he can — that every word means something, and the right thing; that every sentence is grammatical; and that thought follows thought in logical order. He should do his best to make his work accurate in every part, and to combine the parts in a coherent whole.

The student may train himself for the correction of specimens of bad English — the second part of the examination — (a) by correcting his own work; (b) by correcting the bad English of others.\*

\* A book to be recommended for this purpose is *The Foundations of Rhetoric* by A. S. Hill. New York: Harper & Brothers.



In preparation for both parts of the examination, he should study the elements of grammar and rhetoric; and he should apply what he learns (*a*) to his own writing and (*b*) to passages in the prescribed books.

GREEK. — The examination in elementary Greek tests the candidate's ability to translate simple Attic prose at sight. In order to meet this requirement the candidate must possess a good practical knowledge of the forms and constructions of the language and must have command of a considerable vocabulary. The essential forms and ordinary constructions should be thoroughly mastered. From the beginning, practical use should be made of the knowledge acquired by translating Greek into English and English into Greek, first single detached sentences and then, as soon as possible, connected passages. The acquisition of a vocabulary should be systematically pursued. Important words should be daily committed to memory, not as separate units, but with regard to their affinity in form and meaning. These groups of related words will grow from lesson to lesson. In acquiring the elements of the language some such help should be resorted to as *The Beginner's Greek Book*, published by Ginn & Company, Boston, which supplies materials and indicates the method.

When the elements have been acquired, the pupil should read extensively in Xenophon, the most of whose writings are accessible in good school editions. He should be required to read aloud, and should be taught to depend, in reading, upon his own resources so far as possible. He should commit the new words that he meets to memory, and should confirm his knowledge of forms and constructions by systematic use of a grammar. He should aim to learn to read freely and with ease, but always exactly. The total amount read in preparation for the examination should not be less than three hundred or four hundred pages.

LATIN. — The examination in elementary Latin demands of the candidate ability to read simple prose which he has not read before. This is the main requirement; but to enforce thoroughness and exactness in the candidate's training, questions on the ordinary forms and constructions of the language are appended to the passages set for translation. Thorough preparation for this examination requires, for the average student, a three-years course, and this is the time usually given to it; some of the best schools give even more. The student's training should be of the same general character as that recommended in Greek. The author most commonly read is Caesar; but others,

such as *Nepos* and *Quintus Curtius*, may be used advantageously for supplementary reading. Pupils from the best schools have also usually read selections from *Ovid* or a few books of the *Aeneid* by the time they take the elementary examinations, although ability to read these authors is not required.

GERMAN. — A student who wishes to fit himself to pass the elementary examination in German for admission to Harvard College should first master so much of the grammar as is contained in Sheldon's "Short Grammar." He is advised to give especial attention from the beginning to the rules for pronunciation. The study of the grammar should be accompanied by the careful reading of at least two hundred duodecimo pages of easy German; for this purpose, the use of a graded reader is recommended, such as *Brands's Reader* (Allyn & Bacon, Boston); or *Joynes' Reader* (D. C. Heath & Co., Boston), supplemented by selections of historical prose like those contained in *Beresford-Webbs Historische Erzählungen* (D. C. Heath & Co., Boston). The student is advised to give himself a good deal of practice in reading "at sight"; that is to say, as soon as he has mastered a small vocabulary he should try to make out, without too constant use of the dictionary, the meaning of easy sentences which are new to him. In so doing, he should, however, take great care not to form the habit of merely guessing at the meaning of a sentence.

The one point in grammatical study which will best help the student to read at sight is a thorough mastery of all the irregular (or "strong") verbs. Students who wish to take German courses of a literary nature in College should also have considerable practice in translating, into German, not only simple sentences, but also connected pieces equivalent to at least ten pages in *von Jagemann's Materials for German Composition* (Henry Holt & Co., New York).

FRENCH. — To prepare for the elementary examination in French, the student should use such books as *Chardenal's* first and second French courses and (in case he is working without the aid of a competent teacher) the keys to the exercises of the same. A student working without a teacher should write the exercises, then correct them with the help of the key, and write them over again a few days later without looking at the first draft. Not less than five hundred pages of French should be read. The best books to begin with are readers, such as the first part of *Bôcher's French Reader* (omitting the selections in verse), or *Macmillan's Second Progressive French Reader*; then easy novels and plays, such as *l'Abbé Constantin*, by *Ludovic Halévy*; *la Poudre aux Yeux*, and *le Voyage de M. Perrichon*,

by Labiche. Excellent, as well as easy, historical reading will be provided by the Charles XII. of Voltaire. It is essential that some idea of the pronunciation should be obtained from some one fairly conversant with the French language. Gasc's French-English and English-French Dictionary will be found at least as convenient as any.

**HISTORY.** — The requirement in history is intended to call for a substantial piece of work, equal to that demanded in any other subject occupying one hour on the examination programme. The books named in the Catalogue to "indicate the amount of knowledge demanded" represent the minimum of fact which a candidate is expected to master. The preparation should be such as to enable the pupil to use his facts. The "additional readings" are therefore particularly recommended, showing how to reason from facts, and the larger the amount of reading which is thoughtfully done, the greater will be the number of things which the pupil remembers because he is interested in them. The best method of instruction is to use a text-book as a guide, and to require pupils from day to day to read the "additional readings" and like works giving other accounts of the same events or institutions. Care should be taken that pupils should remember the ideas of the books, but state them in their own words. Much may be accomplished by distributing topics among the members of the class for special preparation, the best of them to be reported to the class. In such cases the teacher should take care that every pupil masters also the general lesson. The teacher will find it useful to his pupils frequently to set them questions, so put as to make each one think about and combine for himself the facts with which he is dealing. Answers should be written. Candidates studying by themselves should read text-books and additional readings carefully, reviewing at times by taking up such compendiums as Ploetz's *Epitome*, and trying to bring together from memory the causes and results of events mentioned. The geography may be best learned by the use of outline maps, boundaries being drawn and places located from memory.

**MATHEMATICS.** — A thorough, practical acquaintance with ordinary arithmetic is assumed as underlying all preparation in mathematics. But no examination is held in arithmetic; and students are advised not to waste their time on merely puzzling problems, which can be better solved by algebra, or on the details of commercial arithmetic. The "four rules," the operations on vulgar and decimal fractions, the simpler reductions and combinations of compound numbers, and the

extraction of the square root ought, however, to be thoroughly understood, in such a manner as to be easily and accurately worked out; for these afford the necessary basis of mathematical knowledge.

The examinations in elementary algebra and plane geometry require not only accurate knowledge of those subjects, but the practical power — which can easily be gained by training — to use that knowledge in the solution of new problems and examples. Memory is indispensable here as elsewhere; but in mathematics, its part should be as small as possible. The student should strive to attain a firm hold of the *reasons* involved in the demonstrations, solutions, constructions, rules, and methods presented to him; to remember those reasons through the force with which they are impressed on his mind; and to remember the details of his subject, because he remembers their reasons. This requires earnest, patient, concentrated study; but the habit once formed, mathematics becomes easy, and the student can enter a mathematical examination with confidence.

The list of subjects in algebra, given in the announcement of requirements, should be carefully considered; and the student should not fail to cover the whole ground there specified. A large number of examples should be solved; so that the student may learn to do his work with reasonable quickness, as well as with clearness, facility, and exactness. The examination aims to test all these qualities. The solution of tolerably complicated literal quadratics; the various methods of elimination, for equations of the first two degrees; the putting of problems, in a neat manner, into equations; the working of all the algebraic operations both for integral and for fractional expressions — may be specially pointed out as important subjects of attention. The student should learn to arrange his work in a clear, orderly, and compact fashion. Wentworth's *Elementary Algebra* (Ginn & Co., Boston) is widely and successfully used by schools which prepare for this College. But any reputable text-book, if it is well provided with examples and covers the whole ground required, may be employed. Wentworth's *College Algebra* (same publishers), Chaps. X. and XI.; Todhunter's *Algebra* (Macmillan & Co., New York, Chaps. VI–VIII., XIII., XVIII., XIX., XXI.–XXIV., inclusive; and Wentworth and Hill's *Exercise and Examination Manuals* (Ginn & Co.) contain good examples for practice.

In geometry, the student should guard against committing the demonstrations and solutions to memory from his text-books. He should, so far as possible, work them out for himself, with his own diagrams, using the book as a guide, and always bearing in mind that his object is to learn a subject, not a particular author's presentation of that subject. He should make his diagrams as different from those



drawn in his books as the conditions of the question allow ; he should often use different lettering from the book ; and sometimes try to invent proofs and solutions of his own, remembering always that the shortest and simplest methods, if rigorous, are best. This way of working will help him towards the solution of original problems, on which he should carefully prepare himself. It is an excellent practice to perform many actual constructions with the rule and compasses, according to geometric principles, and with the utmost care and finish. The student thus becomes familiar with the conditions of the possibility of a construction and with the actual use of theorems ; and acquires a greater interest in his study. But he should remember that a fine drawing, however useful in its own way, has no geometric value ; it is unnecessary to a sound demonstration and is powerless to redeem a faulty one. Byerly's Chauvenet's Geometry (Lippincott Co., Philadelphia) is to be strongly recommended as a suitable text-book ; Wentworth's Geometry (Ginn & Co., Boston) may also be favorably mentioned ; but, as in algebra, any standard treatise may be chosen. In addition to the regular text-books, Julius Petersen's "Methods and Theories for the Solution of Problems, etc." (Sampson Low & Co., London) may be used with advantage by the student who has the time and inclination to make special studies in the art of geometric invention.

One third of *one full year* of work may be taken to represent the time devoted to the study of elementary algebra at good schools ; and one fifth of a year, the time devoted to plane geometry. A capable and somewhat mature student may prepare himself satisfactorily for the examinations in decidedly less time ; but, on the other hand, the student who can give more study to plane geometry especially is strongly advised to do so. A thorough mastery of either of these subjects, on which all higher study of mathematics depends, and which contribute indirectly in an important degree to a vigorous mental training, necessarily requires time for the assimilation of the new conceptions and processes which characterize them, and for the formation of habits of exact thought.

ELEMENTARY PHYSICS. — Previous to 1886 the only requirement in physics for admission to Harvard College was text-book work. In that year and the year following a pamphlet was prepared by the College describing in detail a laboratory course intended as an alternative for the text-book course. A candidate for admission may therefore now offer either a text-book course or a laboratory course. The laboratory course is strongly recommended to all who can take it.

The text-book alternative is retained because the teaching of physics by laboratory methods has not yet become general in the schools of the country at large. Concerning this requirement nothing need be added to the statement of the Catalogue, which is as follows: Astronomy [The first eleven chapters of Young's Elements of Astronomy (Boston: Ginn & Co.)] and Physics (Avery's Elements of Natural Philosophy\* or Gage's Elements of Physics). This requirement, if fully and thoroughly met, probably imposes as much work upon the student as the laboratory alternative.

Inquiry has shown that in a considerable number of the best schools which fit for Harvard College about five school-hours per week, presumably with some hours each week out of school, for one year were devoted to physics. Accordingly, the laboratory course described in the pamphlet was planned to occupy the student, in school and out, about seven or eight hours per week for one year.

As physics is no longer a required study in college, it was borne in mind, in planning the laboratory course for the schools, that very many of those taking it would never have any other systematic course in physics. Accordingly the exercises were so chosen as to cover a wide range of subjects and to have many applications in the experience of every-day life. The course at its last revision, in 1889, was arranged in forty-six exercises, any six of which may be omitted by the candidate. The examination for those who present this course consists of a written test upon questions closely connected with the work of the course, a laboratory examination, usually upon the exercises of the course, and an examination of the note-books used during the progress of the course in the schools. The written examination, though less important than the other two, and comparatively easy, gives valuable evidence as to the intelligence with which the student has carried on his work and the thoroughness with which he has mastered its principles.

Particular attention has been given to the question of pecuniary expense in the arrangement of laboratory course, and with such success that the course is fully established in most of the schools that send many students to Harvard and is gradually making its way into smaller schools. The pamphlet describing this course is called a Descriptive List of Elementary Physical Experiments. It is for sale at the University Bookstore, Cambridge.

\* The following portions of the 1885 edition may be omitted:—sections I. and II. of chap. I. (excepting arts. 23-30), arts. 254-267, 346-349, 371, 411-415, 445-455, 464-467, 470-476, 707-714, 729-745, and the whole Appendix.

*Advanced Studies.*

Considerably more advanced training is also required in from two to five of the following subjects: Greek, Latin, German, French, mathematics, physics, chemistry. If Greek is omitted from among the elementary subjects, four of these advanced subjects instead of two must be offered, and they must include a considerable part of the advanced mathematics and sciences. For a precise statement of the omissions from the elementary list and the corresponding substitutions from the advanced list the student must consult the Catalogue.

The following suggestions may aid students in preparing for examination upon the advanced studies: —

**ADVANCED GREEK.** — The requirement in this subject is the power to translate at sight average passages from Homer, or less difficult passages from both Homer and Herodotus, and to answer questions on the usual forms and ordinary constructions of the language and on prosody. In acquiring a Homeric or Herodotean vocabulary to meet this requirement, the same method should be pursued that is recommended in the case of Elementary Greek. In Homer the reading should not be confined to selections from the Iliad only, but parts of the Odyssey should be added. From four to six thousand verses of Homer will ordinarily be sufficient, although more may well be read. There should be constant practice in translation at sight, both written and oral, and all translations should be in good idiomatic English. Antiquated editions should be carefully avoided. These are particularly dangerous guides in the matter of Homeric forms, syntax and prosody, which should be studied in some recent book such as Seymour's *Homeric Language and Verse*, a little work published separately or as an introduction to Seymour's edition of the Iliad.

**GREEK COMPOSITION.** — This subject should not be regarded as something set off by itself, but there should be constant practice in it, side by side with translation from the Greek. The Greek Department recommends that from an early stage the pupil should be accustomed to translate into Greek, both orally and in writing, English exercises based upon the Greek which he is actually reading. Such exercises will be found in most of the introductory books now in use, but frequently the best results will be obtained if the teacher composes the English exercise himself, suiting it to the capacity and special needs of the pupil. At the outset detached sentences may be employed, and these will always be found useful whenever the pupil is beginning upon a new principle of orthography or syntax; but as soon as possible he should be introduced to connected narra-

tive, in the shape of passages based upon the prose author whom he is reading. Examples of the kind of exercise in narrative recommended will be found in Woodruff's *Greek Prose Composition* (Boston: Leach, Shewell & Sanborn) or in Allison's *Greek Prose Composition* (Boston: Allyn & Bacon). But here again exercises prepared by the teacher himself will often be of more benefit to the pupil. They may be based not only upon Xenophon but also upon other authors; for example, upon the simple narrative parts in the orators or in Plato; or Herodotus may be used, the pupil of course being required to write his version in Attic Greek. Sometimes the exercise prepared by the teacher may be a close translation from the Greek author; then the pupil, after writing it, has an opportunity to see his Greek corrected by the original. When, however, the exercise is not a translation, but a free paraphrase or narrative based upon the Greek, the original model may be put into the pupils hands for study before he begins to write; it may even be made the subject for study and recitation in the previous meeting of the class.

ADVANCED LATIN AND LATIN COMPOSITION. — In the examination in Advanced Latin the candidate is required to translate at sight passages of average difficulty from Cicero and Virgil; and the thoroughness of his preparation is further tested by questions on forms and constructions, and on prosody. There is also an examination in Latin Composition, demanding of the candidate ability to translate into Latin a passage of connected narrative. The two examinations are separate, so that the 'Advanced Latin' may be taken without the composition, if the candidate does not need the latter to fill out his quota of advanced studies. The wiser course, however, is to take both subjects, if one is taken. Practice in composition should not be omitted at any stage of the preparation in Latin, and it should be carried on in connection with the pupil's reading, the passages for translation into Latin being based on the Latin text which he is studying at the time. Good models for this sort of work may be found in Collar's or Daniell's *Latin Composition*. Such practice is almost indispensable to a clear and accurate understanding of the language, and it will, moreover, put the student in a much better position for continuing his study of the classics in College, if he wishes to do so.

Practice in reading should include a thorough and exhaustive study of a moderate portion of each of the authors, and more rapid reading, largely at sight, of a considerable amount. There should be frequent practice in written translation. But the fact should be constantly impressed upon the pupil that translation is not reading. The two



are separate, and should both be carefully looked after by the teacher. A strong effort is necessary to teach the pupil to get at the meaning in the original, and to regard translation as a matter of English composition that comes after, when the thought to be expressed has been clearly grasped. Reading aloud should be constantly practiced, always with due expression and emphasis, and, in poetry, with equal observance of the rhythm and the sense.

ADVANCED GERMAN. — Students should read the following books : Riehl, *Der Fluch der Schönheit* ; Freytag, *Aus dem Staat Friedrichs des Grossen* ; Heine, *Die Harzreise* ; Goethe, *Dichtung und Wahrheit*, first three books ; Lessing, *Minna von Barnhelm* ; Schiller, *Wilhelm Tell* and *Das Lied von der Glocke* ; thirty pages of lyrics and ballads. The candidates will be expected to translate passages selected from the books prescribed ; to show their knowledge of German accidence and syntax, and their familiarity with the contents of the prescribed books, by writing short themes on subjects suggested by these books ; and to translate at sight, passages from books of a similar grade. The preparation for the examination in Advanced German should therefore include, beside the reading, a thorough drill in German grammar, and constant practice in reading at sight and in writing German. Students who wish to take in College literary courses (all of which are conducted in German) should, moreover, accustom their ears as much as possible to the sound of the spoken German.

ADVANCED FRENCH. — With the exception of a French passage to be translated into good idiomatic English, the whole paper is to be written in French. Ability to write French is therefore the object the candidate should have striven to attain ; for it will outweigh, in the examiner's eyes, knowledge of the books prescribed. To a student preparing without help of teacher, Kastner's *Elements of French Composition* (Schoenhof, Boston, Ed. 1890) is recommended. The book contains both rules of syntax and vocabulary. All the exercises of Part I. and not less than seventy-five of Part II. should have been written. The reading and writing of French should go on together. The books prescribed for the examination are announced in the annual Catalogue. After having made himself acquainted with their subjects, the candidates should train himself to write in French a short, simple summary of the book read. Attention is called to the importance of understanding easy French, slowly spoken. This is not a *sine qua non* of passing the examination, but it will prove of great advantage to the student, as any course that he may elect in the department, is conducted in French.

ADVANCED MATHEMATICS. — Each of the four advanced admission subjects in Mathematics is taught as a half-course in the college, that is, it is supposed to occupy at least one-fifth of the student's working time for a half-year.

As these subjects are elective and are of college grade the candidate for admission is naturally held to a rather higher standard than in the elementary subjects.

The ground to be covered and the books recommended are carefully described in the "Announcement of Requirements for Admission": in the Catalogue, and little need be added to what has there been said concerning methods of study.

The aim of the examiners, as in the case of the elementary Algebra and the Plane Geometry, is to test power rather than knowledge; and power can be gained only by careful practice in constructing new demonstrations and in solving unfamiliar problems.

In preparing for the examination in Logarithms and Plane Trigonometry much attention should be given to acquiring skill in the use of Logarithms and in computing with the aid of Trigonometric tables both natural and logarithmic. Peirce's "Mathematical Tables" are furnished at the examinations, and it is well to become familiar with them beforehand; but the essential thing is *to learn to get from any table as accurate results as the table can be made to give.*

In Analytic Geometry, practice in solving problems is of prime importance, and much time should be given to problems not involving numerical data. A theorem is not proved by proving a special case under it, and *in Analytic Geometry it is more important to be able to prove Geometrical Theorems than to solve numerical problems.*

ADVANCED PHYSICS. — To be able to prepare in the advanced physics the candidate must previously have taken the elementary laboratory physics and must be familiar with the principles of algebra, geometry, and of plain trigonometry. At least sixty experiments must be performed, distinctly higher in character than those performed in the elementary laboratory work, requiring more skill in manipulation and involving the application of more refined theoretical corrections. They should cover judiciously the several departments of physics, mechanics, sound, heat, light, magnetism and electricity. Undue preponderance of any one department should be especially avoided. The experiments should be carried on in an intelligent and thoughtful manner, — the mere mechanical performance will prove of little value. Both a written and a laboratory examination will be given.

CHEMISTRY. — The requirement in chemistry is intended to secure a preliminary training in the methods and logic of experimental science. Although defined as “A course of at least sixty experiments in General Chemistry actually performed at school by the pupil,” these experiments must be such as will secure the end in view. The experiments should illustrate and enforce all the fundamental principles of chemistry. They should involve both weighing and measuring; and a course consisting chiefly of simple qualitative reactions is not regarded as an adequate preparation. The general character of the experiments thought best fitted to afford the training desired is plainly indicated by a “Descriptive List” printed by the University, and a course which will satisfy the requisition has been fully developed in a 12° volume of 200 pages entitled “Laboratory Practice,” prepared by Professor Cooke, and published by D. Appleton & Co., New York. It is not intended to limit the candidate to the experiments on the descriptive list, but those selected should cover an equally broad ground and imply as much thought and skill. In this connection it should be borne in mind that the requisition in chemistry ranks not with the elementary but with the advanced requisition, both in mathematics and in physics.

Before a candidate is admitted to the examination in chemistry he must present the note book of his laboratory work bearing the following endorsement by his teacher: —

#### CERTIFICATE.

[CHEMISTRY.]

This note-book contains the original record of the laboratory work of

.....  
performed by him under my personal supervision. The notes on the right-hand pages were made by him in the laboratory at the time when the experiments were performed.

The laboratory work occupied..... hours a week for..... weeks.

.....Teacher.

.....School.

Date.....

A note book so endorsed is regarded as *prima facie* evidence of the candidate's preparation, but he is also required to pass both a written and a laboratory examination. The written examination is short and such questions are asked as will discover whether the laboratory work has been conducted with sufficient thought. In the

laboratory examination the candidate has the opportunity to show that he has acquired skill in experimenting. The note books may be presented and the written examination passed at any of the places where admission examinations are held by the University; but the laboratory examination must be passed at Cambridge, under the supervision of an instructor of the department of chemistry. These laboratory examinations are held at one or more convenient hours on the Thursday before Commencement, in June, and on Thursday, the first day of the Fall term.

Students who pass the entrance examination elsewhere, may defer the laboratory examination until they join their class at Cambridge. If the result is otherwise satisfactory they will be admitted to college provisionally, and the partial condition may be removed on passing the laboratory examination on the first day of the opening term as stated above.

While the laboratory work above described and the study which such work, properly conducted, implies constitutes the formal requisition and limits the ground of the examination, it is in the highest degree desirable that the student should become conversant with as wide a range of elementary chemical facts as possible. Such additional facts should be presented by the teacher and illustrated by experiments when practicable, but without imposing on the student the constraint of memorizing the subject matter or preparing it for examination.

There are many schools which are not prepared to furnish even their best and most ambitious pupils with all the training which these requirements demand; nevertheless the number of schools and small colleges which fit students for Harvard College is large, as will be seen by consulting the Appendix, and might be much larger if pupils and their parents insisted upon having school facilities increased in localities where incompetent teachers and meagre expenditures are not necessary evils. The best fitting schools for Harvard College are those which the table in the Appendix shows to have prepared the largest number of successful candidates in recent years.

It does not necessarily follow because a candidate for admission has been poorly prepared in one or two subjects, owing to lack of competent instruction, that he cannot enter Harvard. If, by passing creditably in the subjects in which he has been trained, he clearly shows capacity and ambition, he will be admitted on condition of subsequently making up his deficiency. The number of subjects in which he may be conditioned varies according to the circumstances, but does not usually exceed three. After entering College he is



allowed to cancel these conditions, either by passing examinations on the same subjects or by taking as a part of his college studies advanced work in the same department, the satisfactory performance of which proves that he has more than made good his previous defects. The exact number of conditions allowed can never be stated in advance, for the reason that each case is considered on its merits. All conditions must be removed before a student can attain the Junior class.

It frequently happens that students who do not feel that they can devote four years to college study as candidates for the degree of A.B. desire to pursue special work leading to some chosen goal. Such persons can obtain instruction at Harvard by entering as special students. Before the opening of the college year an applicant files with the Secretary a written application in which his previous training and future plans are outlined; and he accompanies this with letters from teachers and friends testifying to his character and capacity. These papers are read by a committee of the Faculty, and if found satisfactory the candidate is allowed to register at the opening of the next academic year as a Special Student and to begin work in such courses as he may select with the approval of his adviser. If his subsequent conduct shows that he is either not studious or of doubtful character, he is deprived of the privileges of the University.

The process of admission to regular standing and recognized candidacy for a degree is more complicated. Most students prefer to divide their admission examination into two parts, taking one part in one year and the remainder the next. Sometimes they take one part in June and the other in September. Under no circumstances are they allowed to divide their examinations into more than two such parts. Where the division is between two years, the first part is called the Preliminary Examination. In order to be recognized as a preliminary candidate, a student must send to the Secretary a clear and explicit statement from the head-master of his school, expressing the master's belief that the student is properly prepared to take certain preliminary examinations which the certificate must specify. Until this certificate is received by the Secretary the candidate is not entitled to enter the examination. If teachers desire blank forms for use in certifying to their candidates' preparation they can be obtained on application. This requirement of a certificate does not prevent students of limited opportunities from "offering themselves" in cases where they are in fact preparing themselves for college; but in such cases the candidate must state that he is his own teacher, and send an exact list of the studies in which he believes himself prepared to undergo examination.

The second set of examinations of a candidate who divides between two years is called the "Finals." It may follow the "Preliminaries" after an interval of a year, a year and three months, or even two or more years. Where all the examinations are offered in the same year, whether part in June or part in September, or all at once, they also are called "Finals," for the reason that each examination taken, whether in June or September, is the final effort of the candidate to pass in that particular subject. Candidates for the "Finals" are not required to present certificates of preparation. The penalty for trying all the examinations in one year, when preparation has been insufficient and when such insufficiency is proved by failure, is that the candidate obtains no certificate for the subjects passed and is compelled to take the entire examination over again. The knowledge of the penalty is usually sufficient to prevent incompetent persons from undertaking the examinations all at once against their teachers' advice. The only certificate required of a final candidate is one of good moral character. This should always come from the principal of his school, or, if he has not had a regular school training, from a clergyman or other responsible person well known in the locality where he resides. If a student cannot show that he is trusted and respected in his school and home, he is not desired in Harvard College. Any attempt to force a person of tainted character into the midst of the University community is considered to be an act deserving the strongest condemnation.

The June examinations for admission to Harvard are held simultaneously in Cambridge and other points in New England; in New York, Albany, and Buffalo; in Philadelphia, Washington, Cincinnati, Cleveland, Chicago, St. Louis, Minneapolis, Denver, San Francisco, Portland, Oregon; Tokyo, and in Europe, at Bonn, Germany. An examination will ordinarily be held at any other point distant from those named, if ten candidates apply for it as early as April 1. In order to enable the College to know how many candidates are to be provided for at each of the regular places of examination, notice of intention to take examinations in places outside of Cambridge must be sent to the Secretary in time to reach him by June 11th. If the examinations are taken in Cambridge, no fee is charged; but, if taken elsewhere, payment of \$5 is required to be made to the Bursar as early as June 11th. The payment should be made by check or money-order drawn to the order of the Bursar and not to that of any other officer. Money should never be trusted to the mail. The check should be sent to the Bursar direct and not under cover to any other officer. Deferred payment of these fees to Examiners is expressly forbidden. One fee covers both "Preliminaries" and "Finals" and

the two sets of examinations need not be taken in the same place. Full details regarding the examinations, including sets of papers used in previous years, are furnished by the Secretary on request.

A candidate for admission to Harvard by the usual process of examination will find no difficulty in taking his examination, provided he notes with reasonable care the directions given him by the officers in charge. There is no need for any well-prepared candidate to feel nervous or timid. He is one of hundreds passing through the same ordeal, all equally new to the situation which challenges their courage. If he is really prepared to enter College, the College is quite ready to admit him. The examination-books will be read and passed upon in ignorance of his identity, and the utmost impartiality will be shown in judging his efforts at each stage of his progress. Honesty in examinations is unquestionably the rule at Harvard. Opportunities to "crib" are few; public opinion is against cheating of any kind; and dishonesty, if detected, deprives the candidate of the chance to enter College.

Information regarding the results of the June examinations is given to final candidates within a day or two after the close of the examinations and to preliminary candidates about ten days later. The autumn examinations are over several days before College opens, so that persons admitted then have time to get settled before attendance at lectures begins. Admission or preliminary certificates are as good one or more years after date as when issued, but delay in entering College is not favored.

Mention has already been made of admission to advanced standing in the college classes. This may be obtained by examination or through recognition of work well done at another college. The usual process where a student at another college wishes to be transferred to Harvard, is for him to fill out a blank furnished by the Secretary, stating in detail all his previous work in fitting for college and after entering it. This he supports by certificates and rank-lists showing his class standing, and forwards them through the Secretary to the Committee on Admission from other Colleges. After allowing full credit for all his work as measured by Harvard standards, this Committee decides in which of the four college classes the candidate belongs. It occasionally, though rarely, happens that students coming from the same class at home are admitted to different standings in Harvard College, owing to marked difference in their scholarship or preparatory training. Any student of limited means and unquestionably high scholarship who is transferred by the recommendation of his teachers from another college to Harvard, is likely to receive favorable answer to an application for aid from the Price Greenleaf

Fund. His application must be filed before May 1. The amount given varies from \$150 to \$250. Applications for admission to advanced standing are promptly considered at any time in the year, summer included. During the past ten years nearly 500 students from other colleges have entered the undergraduate classes in Harvard College. They have come from about 150 different institutions, including all the colleges of size and reputation in the United States and Canada, as well as several foreign institutions of note. Theological seminaries, technical schools, and normal schools of the highest grade have also secured admission for their graduates without complete examination.

A graduate of another college who wishes to take the degree of Bachelor of Arts at Harvard College may register either as an undergraduate or as a member of the Graduate School. The same courses of instruction are open to him in either case and the requirements imposed for the degree will be the same. Students entering with advanced standing are enabled by special provisions in the Regulations to compete for degrees with distinction and for Honors.

The college year opens on the Thursday following the last Wednesday in September. On entering College, every Freshman and Special Student finds himself assigned to some member of the Faculty who acts as his adviser in the selection of his studies and in other matters relating to his new life. The student deposits with the Bursar either a bond signed by two satisfactory sureties or a sum of money sufficient to cover his immediate future liabilities; he secures a seat at Memorial Hall, or in some other boarding-place; registers in the morning of the first day of the term, and enrolls himself in the class of the professors with whom he is to take courses. Thenceforward his duties are clear. They are, however, looked upon by the University as duties to himself and his parents, rather than to the College. Every student is at the outset presumed to have come to Cambridge for the purpose of gaining an education. If he seems to be in danger of forgetting this, he is warned; later, admonished and a letter sent to his home; then, if the presumption of good purpose is negatived by conclusive evidence of his unfitness to care for himself, he is placed on probation, cut off from many privileges and honors, and informed that any farther neglect of work will result in his ceasing to be a member of the University. Students who reach the point of being sent away are, as a rule, manifestly unfit for college life. In the rare cases of actual misconduct, the penalties of suspension, dismissal, and expulsion are enforced.

The work of the Freshman year consists of sixteen hours a week of lectures and recitations, not counting any laboratory or field work



which may be taken. Most of the courses of study begin in September and continue till June. Some end in February and are complementary to other half-courses beginning then and continuing till June. The year is not divided into terms or semesters, but is a unit in itself. Consequently entering College in the middle of the year is unadvisable, and is rarely allowed to candidates for a degree. The work of the three later years of the college course consists of twelve hours of lectures each week with a steadily increasing amount of laboratory work, thesis writing, and outside reading and research. By special consent of the Faculty a considerable number of students do the work of four years in three. Such persons are usually above the average in age and attainments, and are apt to be of limited means. Of the eighteen courses of study required for the degree of A.B. only two are prescribed. The remaining sixteen are elective and are chosen from among the three hundred and thirty or more courses offered by the Faculty of Arts and Sciences. Of these about fifty are open to election by Freshmen. While in one sense an upper classman may take any of the elective courses, it is usually the case that his previous training has fitted him to pursue only a limited number of them, the advanced and technical courses in each department requiring careful elementary training to be taken successfully. The Annual Announcement of Courses of Instruction commonly known as the "Elective Pamphlet," and descriptive pamphlets of the various departments, are issued in May of each year, and contain detailed information regarding these courses. They may be obtained at any time upon application to the Secretary. During the year instructors in the various courses of study submit their students to frequent tests to ascertain whether they are pursuing their work systematically. In all, except laboratory courses or others affording constant intercourse between instructors and students, a written examination lasting an hour is the commonest form of test. Early in February the mid-year examinations are held, continuing for a fortnight. Each examination lasts three hours and covers the work done during the first half-year. In June, at the close of the year, the final examinations are held. They are similar in character to the "mid-years," both being written examinations.

After the final examinations Instructors return grades based upon the student's work for the year and these grades determine whether students are promoted or "dropped." A "dropped" student is, under the rules, on probation at the opening of the next Academic year, and is sometimes obliged to report daily to a tutor or officer of the University until his period of probation is over. The results of the year's work are made known during the summer by printed rank-

lists containing the names of the high scholars in each course, and by private letters, stating the low grades.

President Eliot, in his Annual Report for the year 1888-89, made the following statement regarding "dropping":

"There is a common impression among ill-informed people that Harvard College, although hard to get into, is easy to stay in. How erroneous this impression is may be seen every year in the figures published in the Dean's annual report concerning the changes in the *personnel* of the successive college classes. Thus in October, 1888, it appears from the Dean's statistics for the year 1888-89 (p. 39) that the Freshman, Sophomore, and Junior classes numbered together 825 persons, and that of this number 57 left College at or before the end of the year, and 42 were dropped to a lower class. In other words, it appears that one person in nine failed to maintain his place in the College. The majority of those who leave College altogether withdraw voluntarily; but they do so because they become satisfied after trial that they have not health or capacity enough to meet the demands of the College, or, if they are poor, that their chances of success in College work are too slight to warrant them in incurring debt. The Dean points out with satisfaction that while 42 students were dropped in 1888-89, 34 students who had been dropped in former years succeeded in making good the deficiencies which had caused them to be dropped. The success of College discipline is to be best judged, not by the number of the lost, but by the number of the redeemed."

Immediately after the final examinations in June comes the Seniors' Class-Day and a few days later Commencement, when the many graduates of the College and Professional Schools receive their diplomas at the hands of the President.

Class-Day is the gala day of the Seniors, and thousands of guests, gathered from various parts of the country, enjoy its varied programme. The Class-Day officers are chosen by ballot at a full meeting of the class held in October. The Commencement-Day speakers are appointed on account of high scholarship, the merit of their parts, and their method of delivering them.

The degree of Bachelor of Arts is given in four grades, the degree without distinction, the degree *cum laude*, *magna cum laude*, and *summa cum laude*. Remarkable excellence in any department secures the graduate Honors or Highest Honors. A lower grade of excellence is rewarded by Honorable Mention in the favorite subject. All students whose records at the close of the Junior year indicate that they will probably receive a degree with distinction are entitled to write Commencement Parts in competition for the honor of being

chosen to deliver them. By winning honors in any department a degree with distinction is secured, but the more common ground of a degree with distinction is general excellence in the entire work of the four years.

In the two and a half centuries during which Harvard College has conferred degrees it has graduated more than 12,000 Bachelors of Arts. Many of these men have of course been distinguished in public service, professional, scientific, and literary life, and in the material progress of the country. During the Colonial period there were among Harvard's noted graduates, Increase and Cotton Mather, Paul Dudley, Jonathan Belcher, Benning Wentworth, Thomas Hutchinson, Samuel Adams, John Hancock, John Adams, Jonathan Trumbull, Elbridge Gerry, Jeremy Belknap, Joseph Warren, and Timothy Pickering. In the early Federal period were Rufus King, Fisher Ames, Christopher Gore, Samuel Dexter, Washington Allston, Levi Lincoln, Harrison Gray Otis, John Quincy Adams. Later came Josiah Quincy, Joseph Story, Lemuel Shaw, Dr. James Jackson, Dr. John Collins Warren, Rev. Henry Ware, Rev. William Ellery Channing. To the period before the war of the Rebellion belong Edward Everett, Jared Sparks, William H. Prescott, George Bancroft, Ralph Waldo Emerson, Henry D. Thoreau, Caleb Cushing, Benjamin Peirce, Henry I. Bowditch, Jacob Bigelow, Robert C. Winthrop, and Oliver Wendell Holmes ; and to the war epoch James Russell Lowell, Charles Francis Adams, Charles Sumner, Wendell Phillips, John Lothrop Motley, Benjamin R. Curtis, Jeffries Wyman, Francis Bowen. Best known since the war have been Francis Parkman, Thomas Wentworth Higginson, Edward Everett Hale, George F. Hoar, Joseph H. Choate, Phillips Brooks, John Fiske, William Everett, Charles S. Fairchild, H. H. Richardson, Henry Van Brunt, and Robert T. Lincoln ; while pressing to the front are many younger men, among whom the names of Henry Cabot Lodge, William E. Russell, Theodore Roosevelt, President Charles F. Thwing, President William DeWitt Hyde, Josiah Quincy, and Sherman Hoar are already familiar. Suggestive of our nation's life as this brief and fragmentary list may be, it is much more remarkable for what it omits than for what it records.

## THE SCIENTIFIC SCHOOL.

The second of the departments under the control of the Faculty of Arts and Sciences is the Lawrence Scientific School. As in the case of the College, the conduct of details in this department is delegated by the Faculty to an Administrative Board with a Dean at its head. All instruction given to students in the Scientific School is offered by the Faculty of Arts and Sciences, but instead of being offered in the form of an almost unqualified elective system, as it is presented to candidates for the degree of Bachelor of Arts, it is offered to future Bachelors of Science in the form of seven compactly arranged groups. These groups lead respectively to the degree of Bachelor of Science in civil and topographical engineering, electrical engineering, chemistry, geology, biology; anatomy, physiology and physical training; and in general science. The nature of the instruction given under these groups has already been sufficiently described. In the most of these groups the students are given a limited option in the selection of their advanced studies.

The Lawrence Scientific School building, in which instruction in engineering is given, is situated in close proximity to the College Yard and dormitories, Memorial Hall, and the principal laboratories and museums. As the instruction given in the School is open to the students of the College—hundreds of whom are allowed to make scientific work the basis of their course for the degree of Bachelor of Arts—the number of candidates for the degree of Bachelor of Science affords no indication of the number of students actually engaged in scientific study. Instructors of various grades employed by the School have their headquarters in the laboratories and museums, the Botanic Garden, the Herbarium, and other centres of scientific work. The admission requirements are fewer than those of the College, and consist of the following subjects: history, algebra, plane geometry, logarithms, plane trigonometry with its applications to surveying and navigation, physical science, French *or* German, and English. If the candidate is to enter the course in civil engineering, he must pass an admission examination—in addition to those just named—in solid geometry or the elements of analytical geometry. The admission examinations are held at the same times and places as those of the College, and the papers presented are identical with those in the corresponding College admission examination. The School admits to advanced standing, without examination, on proof of high scholarship elsewhere. The School has in its gift twenty-four scholarships



of an annual value of \$150 each. Eight of these scholarships are assignable to graduates of reputable normal schools in the United States. The incumbents are appointed in the first instance upon the recommendation of the principals of the schools from which they come. Scientific School students have the same rights in the dining clubs, dormitories, gymnasium, athletic fields, and other conveniences of the University which other undergraduates enjoy. They may take courses in other departments of the University without extra charge. Special Students are admitted to the School in much the same way and upon the same terms that Special Students are admitted to the College. Each regular as well as each Special Student in the School is placed under the charge of an adviser who has supervision of his work during his entire course.

Until recently the Scientific School was as distinct a professional school as the Law School or the Medical School, its Faculty being composed of teachers who were also members of the College Faculty. Since its consolidation with the other two departments under the Faculty of Arts and Sciences it has grown with great rapidity, its members being now three times as numerous as they were in 1890, the year preceding the union. This growth has been closely accompanied by expansion in the courses in engineering, by the construction of workshops for students of electrical engineering, by the multiplication of teachers in scientific departments, and by an increase in the aid funds offered to Scientific School students.

It is to be remembered that students in this department are, both in the class-room and in the social and athletic life of undergraduates, indistinguishable from College students. They work side by side under one Faculty, play on the same teams, row in the same boats, and mingle freely in the same societies. As the course for the degree of Bachelor of Science covers four years the class ties between students in Arts and in Science remain unbroken during the whole of their mutual term of study.

## THE GRADUATE SCHOOL.

The Graduate School is the third of the departments under the Faculty of Arts and Sciences, and like the two undergraduate departments it has an Administrative Board and a Dean to care for its routine business. A large and steadily increasing part of the instruction offered by the Faculty of Arts and Sciences is intended primarily for members of this school: and another large part is in advance of an ordinary undergraduate course of study. Seminars, conferences and courses of research are taken almost exclusively by graduates, and many other advanced courses are given mainly for men who have completed, either in Harvard College or elsewhere, their studies for a Bachelor's degree and are now engaged in special work leading to that of a Master or Doctor.

A graduate of any college or scientific school of good standing is admitted to the Graduate School on presentation of his diploma or some equally satisfactory certificate of graduation. Members of this School are not necessarily candidates for any degree: but they may become candidates for the degree of A.M., Ph.D., or S.D., by permission of the Committee on Admission from other Colleges and of the Administrative Board of the School. They may also, as explained below become candidates for the degree of A.B. They may pursue any of the courses of study offered in the department of Arts and Sciences, and may also take any of the studies offered in the Professional Schools. The choice of studies of each candidate for a degree must be approved by the Administrative Board of the School: but any reasonable selection of studies suitable to the student's attainments and of sufficient grade for the desired degree is always approved. A student who means to present himself for a degree, or one who holds a fellowship or scholarship, is expected to do full work: and this requirement is interpreted to mean that he must take in each year the equivalent of four courses of study of advanced grade. But special study of advanced grade, outside of the regular courses may be counted as a part of such equivalent. Other students may take a smaller number of courses, and devote a part of their time to other pursuits. If a student in the Graduate School, who is not a graduate of Harvard College or of the Lawrence Scientific School, wishes to become a candidate for a degree, he must first apply to the Committee on Admission from other Colleges for a statement of the conditions under which he can be accepted as qualified for candidacy.

Persons who never have received any academic degree are permitted to register in the Graduate School, if in the judgment of the Administrative Board they are of suitable age and attainments. If of lower standing in these respects, they may be admitted to one of the undergraduate classes or to the list of Special Students in the College or the Scientific School. Those admitted to the Graduate School must be men of high scholarship, who are fully competent to engage in advanced studies. They cannot become candidates for one of the higher degrees unless they show that they have pursued studies substantially equivalent to those required at this University for the degree of A.B. or S.B.

If any student wishes to become a candidate for a degree, his course of study must be approved as suitable for a student having that intention. In April of each year members of the Graduate School are called upon to state definitely whether they wish to be candidates for a degree in the following June. Persons whose previous course of study has been accepted, without special conditions, as qualifying them to be candidates for the degree of A.M., are admitted to that degree on passing with high credit in four advanced courses of study, or their equivalent, provided they have been in continuous residence during at least one academic year. The degree of A.B. is often conferred upon members of the Graduate School who are not already graduates of Harvard College, and whose previous training does not fit them to become candidates for the degree of A.M. in their first year of residence. At least two years of residence are required of candidates for the degree of Ph.D. or S.D. The only variation from this rule is in the case of graduates of Harvard College or of the Scientific School, who study in part outside of Cambridge under guidance of members of the Faculty. For them one of the two years of residence, but not of systematic work, is sometimes remitted on the ground of their previous residence. Every candidate for the degree of S.D. (except such as hold the two degrees of A.B. and S.B. from this University) is compelled to devote a third year to study or research, but it need not be spent in Cambridge. The degree of Ph.D. or S.D. is not given to every candidate who studies faithfully the required number of years or in fulfillment of a determinate programme. A thesis showing original treatment of an approved subject, or giving evidence of independent research, and thorough examinations, showing high attainments in a broad and connected field of study, are the final tests of the candidate's fitness to receive one of these significant and valued degrees. If by these tests he is found wanting, his term of study must be prolonged or his hopes of attaining the degree relinquished. Detailed statements

regarding the requirements for the degrees A.M., Ph.D., and S.D. are to be found in the Graduate School pamphlet, or the University Catalogue.

During the years from 1880 to 1890, students from 78 different American and foreign colleges and universities were admitted to the Graduate School. During the present year 69 institutions are represented in the School by 214 students. The table on page 14 shows the institutions and localities from which this University draws its graduate students in both pure and applied studies.

The aggregate annual value of the fellowships and scholarships assignable to students in the Graduate School is \$24,450. Details regarding these aids will be found in the Graduate School pamphlet. They must be applied for before March 31. Applications from persons not already members of the University should be accompanied by testimonials from instructors, original publications, and any similar material which will supply evidence of the candidate's fitness for appointment. No preference is given to graduates of Harvard University except in a few cases where such preference is required by the terms of the foundation of the fellowship or scholarship. In some cases the preference is given to persons not graduates of Harvard University, or who have first been graduated at some other college. Where a choice must be made between two candidates of equal merit one of whom has, and one of whom has not already entered the Graduate School, the former will ordinarily be preferred.

In order that any year in the Graduate School may be counted as a year of residence, registration should take place as early as the last Thursday in September, at the opening of the academic year. But students are admitted to the Graduate School at any time in the year; the conditions of their registration being fixed in each case by the Administrative Board.

The Graduate School has recently been reorganized under the Faculty of Arts and Sciences in such a manner as greatly to increase its importance from the point of view of liberal learning, and to put it in relations of mutual support with the College and Scientific School. It enjoys its full share of the attention of the Faculty and of the life of the University. The opportunities for advanced study which it offers should be carefully considered by persons who desire to carry their scholarship beyond the point reached by the college graduate. Young men who are looking to careers as scholars, scientific investigators, teachers, journalists, writers, economists, and legislators, or in any other literary or purely scientific profession, ought, if possible, to devote a year or two to systematic study, in order that they may qualify themselves to cultivate in the best manner the higher



fields of learning in which they mean to labor. It is no longer true that a mere college education is enough in this country to prepare a man for good intellectual work in his generation, without some higher and more special training. The Graduate School may be regarded as the professional department for the literary and purely scientific professions; and the growth of its numbers in the past few years indicates that it is fast gaining its proper place, from that point of view, in the general estimation.

All the privileges of students in the University are open to a member of the Graduate School. He may, under suitable and liberal conditions, enjoy the use of the various libraries, laboratories, and museums of the University; he may take courses in any of its departments without extra payment; he may attend its public lectures and readings; he may use the gymnasium and athletic grounds; he may be admitted to the dining hall, the Foxcroft Club, etc.; he may obtain a college room; he may be elected into the Graduate Club, many of the students' societies, and into the departmental clubs; he may gain access to valuable libraries and collections in the neighborhood of the University. If a zealous and competent student, he will find every provision made for his advancement which the ample resources of the University permit. If he is successful in gaining a degree he will be given all possible aid in securing a foothold in active life of the kind most suited to his inclination and powers.

## THE DIVINITY SCHOOL.

The Harvard Divinity School is non-sectarian, its constitution prescribing that "every encouragement be given to the serious, impartial, and unbiased investigation of Christian truth, and that no assent to the peculiarities of any denomination of Christians shall be required either of the instructors or students." The Baptist, Congregational and Unitarian denominations are represented in its Faculty. It admits to its classes as candidates for the degree of D.B. only persons who have received the degree of A.B., or who satisfy the Faculty that their education has been equal to that of graduates of the best New England colleges. Persons not candidates for the degree of D.B. may be admitted as special students on examination in Latin and Greek. Students can be admitted to advanced standing only on examination, except that graduates of other theological schools who have received the degree of A.B. and who bring evidence of high standing, may be admitted to the Senior class without examination. Graduates of other theological schools, not candidates for the degree of D.B., may be admitted as resident graduates. Such students are encouraged to do independent work in any department of theological study and may take part in any of the exercises of the School. The degree of D.B. is given to successful candidates after a residence of three years, to which a year of post-graduate study may be added. The instruction of the School includes courses in Hebrew; Jewish and Classical Aramaic; the History of Israel. Literary, Political and Religious; New Testament History, Introduction, Criticism and Interpretation; Church History and the History of Doctrine; the Philosophy of Religion; Systematic Theology; Comparative Religion; the Ethics of Social Reform; Homiletics; Pastoral Care; and Elocution. Its studies are to some extent elective, about fifty per cent more hours of class-work being offered than are required for the degree. In connection with some of the courses of instruction, frequent 'Conferences' are held in which students and teachers meet for a more informal discussion of certain aspects of the subjects studied than is possible in the class-room. Students, except special students, may take courses in other departments of the University without charge. The School is amply endowed with scholarships and other beneficiary funds, the income of which is assigned to graduate and other students without regard to denominational differences. Its students have included since 1885, graduates of the following 66 colleges and 24 schools of theology. Those marked

with an asterisk are represented in the School the current year, 1892-93.

## COLLEGES. -

*Adrian,	Hillsdale,	Trinity (Conn.),
Allegheny,	Illinois Wesleyan	*Trinity (N. C.),
Amherst,	Iowa,	Tufts,
Antioch,	Johns Hopkins,	University of Chicago,
*Baldwin,	Knox,	" " Georgia,
Bates,	*Lebanon Valley,	" " *Illinois,
Boston University,	London University,	" " *Indiana,
*Bowdoin,	McGill,	" " Kansas,
*Brown,	Maine State,	" " *Michigan,
Canton,	Mt. Allison,	" " *Nebraska,
*City of New York,	Mt. Union,	" " N. Carolina,
*Colby,	Oberlin,	" " Vermont,
Columbia,	Ohio State,	" " Washington,
*Cornell College,	*Ohio Wesleyan,	" " *Wisconsin,
Dalhousie,	Olivet,	*Wake Forest,
*Doshisha (Japan),	Ottawa,	Washington University,
Denver,	Owens,	(Missouri),
De Pauw,	Pennsylvania,	Western,
*Dublin,	Princeton,	Williams,
*Edinburgh,	Racine,	Wooster,
*Eureka,	St. Francis Xavier,	Yale,
*Harvard,	St. Stephen's,	
Haverford,	*Southern Illinois College,	

## THEOLOGICAL SEMINARIES.

Andover,	General Theo. Seminary, Oberlin,	
*Bangor,	Halifax,	Pacific Theo. Seminary,
*Boston,	*Harvard,	Princeton,
*Cambridge Episcopal,	Hillsdale,	South Baptist,
Canton,	*Meadville,	Tufts,
Chicago Baptist,	Methodist College,	*Union,
*Doshisha (Japan),	Belfast (Ireland),	Western,
*Drew,	Newton,	*Yale.

The number of students in the School is still small compared with that of some similar institutions. For the last three years it has been 40 or 41. The attendance has, however, been slowly but steadily increasing; in the last ten or twelve years the average has nearly doubled. This steady gain promises well for the School. This increase has been very largely in the number of resident graduates. Of these there are this year in the School fifteen, representing nine different Theological Seminaries. The wide range of studies offered by the School, the privilege of attending courses in other departments of the University without extra charge, the opportunities to secure

ample pecuniary aid, and the fact that men of all creeds meet in this School on equal terms, animated by a single purpose, are causes which effectively combine to stimulate this increase. The tuition fee charged in the School is \$50, or only one third of the fee charged under the Faculty of Arts and Sciences. The two Williams Fellowships of \$500 each, open to resident graduate students in the School, are among the most effective aids to advanced theological work in this country. They may be held by distinguished graduates of any school of Theology who intend to enter the Christian ministry.

The other aids offered by the School have an aggregate value of \$8000, which, considering that the usual membership of the School does not exceed forty persons, gives the Faculty the power to pay the greater part of the necessary expenses of any needy student whose worth and ability are satisfactorily established. Only men of ascertained promise and high scholarship are assisted. The buildings of the Divinity School are three in number, a brick dormitory known as Divinity Hall, a small wooden dormitory called Divinity House, and a new and attractive Library. Divinity Hall contains the Chapel of the School and forty-three rooms ranging in price from \$40 to \$80. Divinity House contains five rooms. All these rooms are primarily reserved for students of the School. Divinity Library contains over 24,000 volumes and in addition to the book-stack where they are arranged, the building includes a comfortable reading-room and several lecture-rooms and offices.

In the reading room the most important books connected with the various Departments as well as books for general reference, are reserved for the use of students. To this room students have access during the day and evening. The part of the library thus thrown open numbers about 2100 volumes.

Among the five hundred graduates of the Divinity School many have won distinction not only in the pulpit, but as teachers and authors. The following names are among those most familiar:—James Walker, '17, John Gorham Palfrey, '18, Jared Sparks, '18, George Ripley, '23, Ezra Stiles Gannett, '23, Andrew P. Peabody, '32, James Freeman Clarke, '33, William G. Eliot, '34, George E. Ellis, '36, Theo. Parker, '36, Henry W. Bellows, '37, Frederic D. Huntington, '42, Samuel Longfellow, '46, Moneure D. Conway, '54, Horatio Alger, '60, John W. Chadwick, '64.



## THE LAW SCHOOL.

The Harvard Law School was established in 1817, and at that time was the only school of the kind in this country in close official connection with a college. The School has always been located in Cambridge, and its present building, Austin Hall, was completed in 1883 at a cost of \$135,000. Architecturally, both as regards beauty and convenience, it is one of the most satisfactory of the University buildings. It was designed by the late H. H. Richardson, who was graduated from Harvard College in 1859, and who was the architect of Trinity Church, Boston, and the State Capitol at Albany, N. Y. The building stands on Holmes' Field a few yards from the site of the old Holmes' house. Close by it are Hastings Hall, the finest of the College dormitories, the Jefferson Physical Laboratory, the Lawrence Scientific School and the commodious Hemenway Gymnasium. The number of students now attending the School is about four hundred. In all nearly 2500 men have been graduated by the School since its first degrees were given in 1820. Among its graduates or former students who have been or are well known in public life may be named: Benjamin R. Curtis, '32, Wendell Phillips, '34, Charles Sumner, '34, William M. Evarts, Richard H. Dana, '39, E. R. Hoar, '39, Charles Devens, '40, J. L. M. Curry, '45, Rutherford B. Hayes, '45, Anson Burlingame, '46, Horace Gray, '49, G. F. Hoar, '49, James C. Carter, '50, Dorman B. Eaton, '50, Joseph H. Choate, '52, William E. Chandler, '54, James B. Eustis, '54, Richard Olney, '58, Daniel H. Chamberlain, '64, and Melville W. Fuller. Among its past teachers have been Joseph Story, Simon Greenleaf, Theophilus Parsons, and Emory Washburn.

The course for the degree of Bachelor of Laws is three years in length. Instruction is given in the following subjects:

*First Year.* — Contracts, Criminal Law and Procedure, Property, Torts, and Civil Procedure at Common Law.

*Second Year.* — Agency, Bills of Exchange and Promissory Notes, Law of Carriers, Contracts (Quasi-Contracts), Evidence, Jurisdiction and Procedure in Equity, Property, Sales of Personal Property, Trusts.

*Third Year.* — Constitutional Law, Corporations, Jurisdiction and Procedure in Equity, Partnership, Property, Suretyship and Mortgage.

*Extra Courses.* — Patent Law, Pleading and Practice under the New York code of Civil Procedure, the Peculiarities of Massachusetts Law and Practice.

A professorship in International or Public Law having been endowed in the School, this subject will in the near future be added to those already taught. The present teachers in the School include six professors, two assistant professors, two lecturers and an instructor.

The method of instruction applied in the School is singularly effective. Principles are learned not by memorizing the pages of textbooks, but by analyzing leading English and American cases which include in their decisions and dicta the living body of the law. A student of ability who spends three years of intelligent effort in the School is equipped, except in one particular, for active professional labor in any part of the Union. The exception is the practice and statute law of his own State, if that State is outside of New England and New York, but his familiarity with the fundamental principles of law makes the task of mastering local practice comparatively easy. Honor graduates of the School are certain to receive invitations to enter leading law offices in various parts of the country. During the ten years from 1880 to 1890, 475 graduates of Harvard and 249 graduates of other colleges attended the School. To gain admission to candidacy for the degree of LL.B. a student is required, on entering, either to show that he is a graduate of a college or scientific school of good standing, or to pass creditable examinations in Blackstone's Commentaries, Latin, and in French or some other modern language. Special students are required to meet the same tests. A limited number of scholarships are assigned each year to needy students of at least one year's standing whose rank seems to justify giving them assistance.

The most promising students of each class are elected members of the law clubs, several of which have been in existence in the School for many years, and include in their lists of former members jurists of national and local reputation. These clubs are most useful auxiliaries to regular work, requiring their members to prepare and argue each week cases illustrating the most difficult problems under discussion in the lecture-rooms. The members of the Faculty and other instructors, eleven in number, reside near the School and almost without exception devote their entire time to the work of the School and the personal needs of the students. The regular course of study for the degree of LL.B. calls for ten hours a week in the lecture-rooms during the first year, ten during the second, and eight during the third. For the Honor degree ten hours are required in the third year. The average student of merit works seven or eight hours a day in the School including his lecture hours. Examinations are held in June on the work of the year, and no student who fails to pass in at least three subjects is allowed to remain connected with the

School. Only students of great promise are admitted to the Honor degree.

At least two full years of residence are required of every candidate for the degree. Sometimes students pass advanced-standing examinations and enter at the beginning of the second year. Sometimes they omit residence in the second year — taking the examinations, however, at the usual time — and sometimes they leave the School at the end of the second year and return to take the third-year examinations at the end of that year. Graduates of Harvard or of other colleges who have had their degrees approved by the Faculty of Arts and Sciences, and who are not candidates for the degree of LL.B., may obtain the degree of Master of Arts after one year's satisfactory study in the School, or may take a part of their work in the School and the remainder in the Graduate School.

In 1882-83 college graduates made up sixty-six per cent of the students in the School. This year the percentage is seventy-one. In 1891-92, for the first time, the Harvard graduates in the School were outnumbered by the graduates of all other colleges combined. The preponderance of graduates of other colleges is maintained this year. Of these graduates, 21 are from Yale, 14 from Brown, 10 from Amherst, 8 from Bowdoin, 6 from Williams, 5 from Dartmouth, 5 from Michigan, 4 from Princeton, 4 from Bates, 3 from California, and 3 from Iowa. The remainder represent thirty-three other colleges in this country and Europe. The average age of those entering the School is 22.85 years, the average college man who enters being a little over 23, while the non-graduate is only a little over 22. In time it is likely that none but college graduates, or those who have had equivalent training, will be allowed to enter the School as candidates for its degree.

## THE MEDICAL SCHOOL.

The Harvard Medical School is situated on Boylston Street, Boston, in a building completed in 1883 at a total cost, including land, of \$321,415.62. The Sears' Laboratories of Pathology and Bacteriology, completed in 1890 at a cost of \$35,000, are connected with the School building. The medical department is the largest of the professional schools of the University and one of the oldest, having given degrees since 1788. In all it has graduated more than 3,200 physicians. It gives the degree of M.D. after four years of successful study and examination. Graduates of colleges, scientific schools, or medical schools are admitted to the School without examination. Non-graduates are required to pass in the following subjects: English, Latin, physics, chemistry, and also in either French, German, algebra, plane geometry, or botany.

The Medical School is placed in Boston rather than in Cambridge in order that it may secure the clinical advantages offered by a large city, as for example daily visits to hospitals. During 1891-92, the Massachusetts General Hospital treated 3,409 patients in its wards and 25,819 in its out-patient departments. Its patients come from all parts of the United States and Canada, and students visit them with the attending physicians and surgeons four days in each week. The hospital amphitheatre where operations take place has seats for 400 students. During the same year, the Boston City Hospital treated 7,910 cases in its wards and 15,560 cases among out-patients. Instruction takes place here twice a week. The Boston Dispensary with 42,116 patients in the year; the Boston Lying-in Hospital with 500 patients; the Massachusetts Charitable Eye and Ear Infirmary and other similar institutions are closely allied to the School. The hospitals named draw fifty students a year into their service either as internes or assistants in out-patient departments. Closely adjoining the Medical School is the Boston Public Library (which next to the Congressional Library at Washington is the largest library in America), and the Boston Medical Library Association's rooms containing everything in the way of standard and current medical literature which the teachers and students in the School have occasion to use. The School building contains a compact reference library for daily use.

The standard of the School is high, its examinations are severe, and its facilities of all kinds great. It employs 24 professors and assistant professors and 50 other instructors and lecturers, many of



whom are specialists of reputation. The School has a moderate number of fellowships, scholarships, and other pecuniary aids in its gift which are given only upon clear proof of merit.

The regular courses required for the degree of M.D. are as follows :

*First Year.* — Anatomy, Physiology, Histology and Embryology, Hygiene, Bacteriology, and Medical Chemistry.

*Second Year.* — Practical and Topographical Anatomy, Clinical Chemistry, Pathology and Pathological Anatomy, Clinical Medicine, Theory and Practice, Surgery, Clinical Surgery, Materia Medica, and Therapeutics.

*Third Year.* — Obstetrics, Theory and Practice of Medicine, Clinical Medicine, Surgery and Clinical Surgery, Dermatology, Diseases of the Nervous System, Diseases of Children, Mental Diseases, and Gynæcology.

*Fourth Year.* — Clinical Medicine, Clinical Surgery, Clinical Microscopy, Mental Diseases, Municipal Sanitation, Cookery, Ophthalmology, Otology, Laryngology, Orthopaedics, Legal Medicine, several other required subjects, and twelve elective studies including Dermatology, Neurology, Bacteriology, Operative Surgery, Otology, etc.

The following statements illustrate the methods of instruction adopted by the School in a few of its distinctive departments : —

The course in *Anatomy* covers two years. In the first year there are three lectures a week on descriptive anatomy by a professor, and one recitation a week by an assistant. In the second year there is one lecture a week on advanced and topographical anatomy by a professor, and three a week during the greater part of the year on applied anatomy by an assistant professor. A characteristic feature of the instruction in this department is that every effort is made to give it in a comprehensive and practical manner. Thus, even in the course on descriptive anatomy, the bones and joints are treated of at the same time, and later in the year the arteries, veins, lymphatics and nerves, are considered together. In the second year much use is made of the live model, and of frozen sections. The surgical applications are insisted on. The great use of frozen sections is a specialty. The large models of the bones for use in the lecture room, specimens of which are on exhibition, were first made for this School. The collection of corrosion preparations is, we believe, the finest in America. Every student is required to dissect to the satisfaction of the demonstrator. There is a large collection of bones, kept in boxes, which students can borrow to study either in the building or at home.

*Physiology.* — Instruction in this department is given by lectures, recitations, conferences, demonstrations in the lecture room and practical work in the laboratory. The conference is an exercise in

which the students take a prominent part. Each student chosen to take part in the conferences is required to select a definite question in physiology and to study the literature of the subject as fully as time allows. He then embodies the results of his work, which may also include original experiments, in a short paper requiring about ten minutes to read. After this paper has been read before the class, the subject is open for discussion by the members who, having been notified in advance of the subjects to be presented, are prepared to make remarks and to ask questions of the reader. The officers of instruction also contribute to the discussion in any way that may seem to them desirable. It is generally found practicable to have two papers read and discussed in each hour.

The laboratory is well provided with apparatus for research, and students whose previous training fits them for the work are encouraged to undertake original investigations under the direction of the instructors.

*Chemistry.* — Instruction in this department is given by lectures, recitations, demonstrations, and practical exercises in the laboratory. A competent knowledge of the fundamental principles of chemistry and of qualitative analysis, is a requisite for admission; but for the present courses in theoretical and descriptive (inorganic) chemistry and in qualitative analysis will be given during the first half of the first year to enable those who have been found in any manner deficient, at the admission examination, to make up such deficiencies before entering upon the work of the regular courses. Medical chemistry is taught during the second half of the first year. The laboratory instruction in this course includes the chemistry and microscopy of the urine and the tests for the important poisons. During the second year, the instruction is chiefly clinical in character, the student being taught the diagnosis of kidney and other diseases by an examination of the urine and clinical toxicology. During the summer months, courses are given in those branches of chemistry pertaining to medicine, including a course in general chemistry and qualitative analysis especially adapted to students about to enter the Medical School. The chemical laboratory has accommodations for 212 students, each student having his own desk and apparatus. The supply of material for instruction in urinary chemistry and toxicology is always abundant, and each student is required to examine chemically and microscopically at least two specimens of urine weekly, throughout the year and a half devoted to the study of chemistry. The school possesses a very large and complete collection of preserved urinary sediments, including all of the rare constituents. This is at all times available for

the use of the students, and taken in connection with the abundant supply of fresh material affords an unexcelled opportunity for becoming thoroughly familiar with this important branch of medical study. Instruction in the laboratory is given to the classes in small sections so that each student derives all the benefits to be obtained by individual instruction. The department is fully equipped with the apparatus and instruments necessary for chemical investigations of all kinds, including microscopes for those students whose means will not permit the purchase of this instrument. Special facilities are at all times offered for original investigations.

*Pathology and Pathological Anatomy* are taught by lectures, recitations, and practical instructions in pathological histology. Recently the Sears' Building, the gift of Dr. Henry F. Sears, having been finished, has been used for the instruction in this department. The basement is fitted up for the care of animals and for the storage of material. The first story contains the bacteriological laboratories. On the second floor are the rooms for the officers of instruction and for special students in pathological anatomy and histology. In the third story is the class-room for recitations and demonstrations, and for instruction in pathological histology. An adjoining room is especially constructed for photography. These laboratories open directly into the physiological laboratory which, in turn, is immediately connected with that for chemistry; all the appliances of each laboratory are thus available to the students in any one of them with the least possible loss of time. The collection of the Warren Anatomical Museum is used to illustrate the lectures, and morbid specimens in a fresh state are shown at the demonstrations. The lectures on pathology are mainly given on general pathology including the various processes of disease, the condition and laws under which they are produced, and the effects which they exert on the functions of the body. In the demonstrations the appearances of diseased organs are studied, and the various changes which have taken place in them are described. The instruction in pathological histology is continued throughout the year. In this course the finer changes in the tissues are studied and the manner in which they are produced is explained. Both in this course and in the demonstrations particular attention is paid to the diagnosis of tumors. Each student, provided with a microscope, the necessary instruments and reagents, prepares the various objects and submits them for examination and criticism. The students are invited to be present at post mortem examinations, the method of conducting them is explained, and the students themselves are allowed to perform them. Every encouragement is given to the student to carry on individual work in the pathological

laboratory. All the facilities for work are provided and subjects for original investigation will be assigned to those who have shown themselves capable. Only those students will be allowed to work individually in the laboratory who have shown by their work in the first two years of their study, that they are both diligent and capable. Microscopes will be provided those students whose means will not permit the purchase of an instrument.

*Clinical Medicine.* — Daily instruction is given in this department by clinical lectures, hospital visits, and other exercises. Students are furnished with cases for personal examination, and are called upon to report them before the class, where they are criticised. These examinations are held both in the wards and in the amphitheatre. Another exercise, known as the clinical conference, affords an opportunity for more thorough preparation of cases, more time being allowed for their study. The full written report of a case is read by the student who has examined it. It is afterwards criticised by the class, by the professor of clinical medicine and other teachers in the School. In addition to this, a regular course of supplementary instruction is given in auscultation and percussion, and in laryngoscopy, which affords students an abundant opportunity for acquiring a thoroughly practical knowledge of these methods of exploration.

*Surgery.* — Lectures and recitations. There are also courses on surgical anatomy, minor surgery, orthopedic surgery, surgical histology, bandaging, and operative surgery. In the last, students of the third and fourth classes are supplied with material for repeating the usual surgical operations.

*Clinical Surgery.* — Instruction in clinical surgery is given at the Massachusetts General Hospital and the City Hospital, each week throughout the year, as follows: —

One clinical conference, one clinical lecture, eight visits in the hospital wards, and two public operating days.

The surgical clinical conference is an exercise at which a student of the third class presents an elaborate and carefully prepared paper on a surgical case in the hospital wards, which has been assigned him. This paper he is obliged to read in the amphitheatre of the Hospital before the whole class, and defend it from their criticism. At the close of the exercise the professor of clinical surgery gives a résumé of the case and his opinions upon it. The students of the second class attend these exercises preparatory to their active participation in them in their third year.

The second class is divided into small sections, and daily clinics are given to them in the out-patient department of the Massachusetts General Hospital and the City Hospital, in which students are



brought into personal contact with the patients, have practical exercises in the application of bandages and apparatus, and see a large number of cases of minor surgery.

The clinical lecture is given either over surgical cases brought into the amphitheatre and illustrated by explorations or operations, or at the bedside in the wards illustrating the dressing of wounds, the treatment of fractures, and the progress of cases from entrance to discharge from the hospital. Every candidate for a degree is required to report a case in clinical surgery.

In addition to its regular instruction leading to the degree of M.D., the School offers graduate instruction of a grade heretofore usually sought for only in British or continental schools. This instruction is wholly distinct from the undergraduate instruction in the School and is arranged in courses lasting about eight weeks each and designed to accommodate practitioners whose residence is necessarily brief. Certificates of attendance are issued to those who have taken these courses. Briefly stated the instruction offered to graduates is as follows: In anatomy: anatomy of the joints, illustrated by preparations, frozen sections, and the live model; anatomy of the central nervous system, including cerebral localization and the course of fibres; applied anatomy demonstrated on the cadaver, including surface anatomy; a dissection course. In histology and embryology: human embryology; normal histology; histological technique. In physiology opportunities are given for carrying on original investigations in the physiological laboratory, which is well provided with apparatus for original research, including recording instruments, induction coils, interrupters, galvanometers, constant temperature apparatus, photographic outfit, artificial respiration apparatus, etc. In medical chemistry practical instruction is given in the chemical laboratory, in physiological chemistry; the analysis of urine and other animal fluids in health and disease, and of poisons; and in the examination of blood-stains and other objects connected with medico-legal investigations.

In pathological anatomy courses consist of demonstrations of morbid material and practice in post-mortem examinations, exercises in pathological histology, clinical microscopy, special laboratory examinations. In clinical medicine courses of from 12 to 20 exercises are amply illustrated by cases in hospital wards. In Surgery ten courses are offered at the hospitals. Ample instruction with hospital cases in all stages and the management of convalescents is offered in obstetrics. In dermatology instruction is given at the Massachusetts General Hospital where two thousand cases of skin diseases are treated yearly. In ophthalmology and otology the

instruction is given at the Eye and Ear Infirmary and the large hospitals. At the Infirmary three thousand cases of diseases of the ear are treated each year. Instruction in diseases of women is given at the Free Hospital for Women; in neurology at the Massachusetts General Hospital; in mental diseases at the McLean Asylum for Insane, where the daily average of patients is 169; in diseases of children in five hospitals for children, in some of which wards for scarlet fever and diphtheria offer special opportunities for study; and in legal medicine at the Boston City Hospital.

In hygiene practical instruction will be given in the laboratory at the Medical School in the analysis of air, water, soils, and of articles of food and drink for adulterations. Opportunities will also be afforded for special work. Attention will also be given to the sanitary inspection of houses, public buildings, and premises of offensive trades, and to the investigation of ventilation, plumbing, etc. In bacteriology the courses will consist of instruction in the methods of research, together with opportunities for original investigation. A special course in the practical identification of cholera is being arranged. Graduates of other medical schools may obtain the degree of M.D. at this University, after a year's study in the graduates' course and passing the required examinations, which may be passed at such times as may be agreed upon by the examiners and the graduate student.

The School offers summer instruction of a nature particularly suited for graduates whose opportunities for study have not been great, or who have had no chances to profit by hospital practice. The summer courses are clinical in character and are given in hospitals and dispensaries by the surgeons on duty in them, and in the School laboratories by the officers in charge. The courses given during the summer of 1892 were forty in number and included one or more in each of the following subjects: Clinical Medicine, Physical Diagnosis, Nervous Diseases, Children's Diseases, Diseases of the Eye, Anatomy of the Ear, Clinical and Operative Surgery, Orthopedic Surgery, Minor Surgery, Municipal Sanitation, Bacteriology, etc., etc. Physicians from ten different States and the District of Columbia attended these courses in 1892.

For further information application may be made to Dr. H. P. BOWDITCH, *Dean*, Harvard Medical School, Boylston Street, Boston, Mass.

## THE DENTAL SCHOOL.

Being closely connected with the Medical School and dependent upon hospital and infirmary work to be secured only in the midst of a large city, the Dental School is situated in Boston. At present it occupies the building on North Grove Street, for many years used by the Medical School, but a fund of \$100,000 is being created to give the School ample accommodations of its own nearer to the new Medical School building. To enter the School a candidate who has not passed an examination for admission to the College or the Scientific School of the University, or who has not already taken a degree in arts, letters, science, or medicine, must pass an examination in English, physics, and either Latin, French, German, algebra or plane geometry. Admission to advanced standing is granted upon satisfactory grounds.

The course for the degree of Doctor of Dental Medicine is a graded one, covering three continuous years. The first year is nearly identical with that in the Medical School. Thirty-six persons join in the instruction of the School, which is thorough and exhaustive. No one can secure the degree who has not studied medicine or dentistry three full years and passed the required examinations of the School. The Infirmary and laboratory practice afforded by the School is invaluable. The Infirmary remains open during the summer and one of the clinical instructors and a demonstrator are in attendance daily. Students have access to the Boston hospitals, and to the dissecting-rooms and museum of the Medical School.

The instruction offered by the School is briefly described as follows:—

*Anatomy.* — Lectures, demonstrations, various practical exercises, including dissection under the direction of the demonstrator; recitations.

*Physiology.* — Lectures, recitations, conferences, and practical demonstrations in the laboratory. Opportunities for original work in the physiological laboratory of the Medical School are offered to those who are qualified.

*Chemistry* is taught mainly by practical work in the laboratory, each student having his own desk and apparatus.

*Surgery.* — Lectures and recitations in oral surgery illustrated by colored drawings and by recent and morbid specimens. All approved instruments and apparatus are exhibited and explained. Operations are performed on the living subject at the hospitals, and upon the

dead body. Instruction is given in the use of anaesthetics. Instruction in clinical surgery is given at the Massachusetts General Hospital and City Hospital every week.

*Surgical Pathology.* — Lectures and recitations embracing the subjects of shock, inflammation, repair, suppuration, ulceration, mortification, embolism, pyaemia, erysipelas, and tetanus.

*Operative Dentistry.* — The instruction in this department is both didactic and practical. The professor and other instructors endeavor to demonstrate all known methods of performing operations upon the teeth and other tissues involved. The treatment of decay, the materials used for filling teeth, the most approved instruments and appliances used in operating upon the teeth, are appropriately discussed. Clinics are held at the Infirmary, and every available means used to make the student practically acquainted with all the modern improvements of this important branch of dental science.

*Oral Anatomy and Physiology.* — Lectures and recitations upon the minute anatomy of the teeth and their histological development, and the surgical pathology of the tissues in and about the mouth. The study of bacteria. Examination of the tissues in a healthy and diseased condition, with instruction in their preparation.

*Dental Pathology.* — In the beginning of the course of lectures the general principles of pathology, including etiology, nosology, semeiology, diagnosis, and prognosis are outlined. The various pathological conditions in their relations to one another and their modifications of structure and function are taught. This prepares the way for the special pathology of the region with which the dentist has most to do. The diseases of the dental and contiguous tissues are considered in detail, with reference to their nature, causes, manifestations and terminations, and their relations with systemic conditions.

*Materia Medica and Therapeutics.* — A complete course of materia medica and therapeutics is taught by lectures and recitations. Special attention is given to those drugs which the dentist is called upon to use, and a collection of drugs is open to the inspection of the student.

*Mechanical Dentistry.* — Lectures and practical work in the laboratory; the manner in which mineral teeth are constructed, the principles and method of carving and furnace-work, and all compounds used for artificial teeth; also metallurgy, and the manner in which gold and silver plates are prepared and adapted to the mouth; the use of rubber and other materials as bases.

*Orthodontia* is taught by lectures and by practical work in the Infirmary. Models of cases are shown, and students are made



familiar with the principles underlying the irregularities and the various appliances for their correction.

*Neurology.* — A course of six lectures on neurology will include a brief review of the anatomy and physiology of the nervous system, the anatomy of the trifacial nerve being made the subject of special study. The nervous disturbances liable to be set up by dental irritation, and, conversely, those likely to produce odontalgia, will be considered as fully as the limited nature of the course permits, special attention being paid to trifacial neuralgia.

*Dental Chemistry.* — Metals: their properties and ready chemical identification. Alloys and amalgams: formation, properties, and short methods of analysis. Compounds, inorganic and organic, of dental importance. Chemical processes which take place in the mouth. Antisepsis: all processes described are illustrated as far as possible by practical demonstration.

*Clinical Lectures on Operative Dentistry.* — Operations on patients, demonstrations and exhibition of models, showing the individual methods of the lecturers with descriptions and explanations.

The diploma of the School is accepted by the English Board of Registration under the Dental Act, so that graduates of the School who are not British subjects can practice dentistry in Great Britain without further examination. Board and lodging are obtainable in Boston at from five dollars a week upwards.

The School granted its first degree in 1869, and since that time has graduated over two hundred persons. Its graduates are practising in a majority of the northern and western States, in Canada, in most of the principal countries of Europe, in Australia, Japan, the West Indies, and South America.

## THE SCHOOL OF VETERINARY MEDICINE.

The School of Veterinary Medicine was founded in 1882. It has already rendered a service to the country in being among the first to introduce a graded course of study of the kind long in force in the best European schools. This change may be said to have put the modern science of veterinary medicine upon a secure foundation in America.

Entrance to its classes is guarded by admission examinations in English, arithmetic, and in either French, German, Latin, algebra, plane geometry, or zoölogy.

Its course extends over three years of about nine months each, and is in detail as follows :

*First Year.* — Anatomy, Physiology, General Chemistry, Botany, and Practical Anatomy.

*Second Year.* — Advanced Anatomy, Practical Anatomy, Medical Chemistry, Materia Medica, Therapeutics, Pathological Anatomy, Surgical Pathology, Theory and Practice of Veterinary Medicine, Clinical Medicine, and Clinical Surgery.

*Third Year.* — Warrantly and Evidence, Veterinary Therapeutics, Obstetrics, Theory and Practice of Veterinary Medicine, Cattle Practice, Operative Veterinary Surgery, Ophthalmology, Parasites and Parasitic Diseases, Clinical Medicine, and Clinical Surgery.

The instructors in the School number 23 persons ; and where the subjects are common to all branches of medicine, the instructors in them are drawn from among the members of the Medical Faculty of the University. The School has no scholarships. In order to be in the centre of a large and busy community, the School and its Hospital are situated in Boston, where, in buildings erected particularly for its uses, all purely veterinary instruction is given.

.. The Hospital building offers every advantage for the observation and treatment of sick animals. It is a substantial structure of brick, three stories high, and has been designed and built especially for its uses. Upon the first floor are the office, a large operating-room lighted from above, five commodious box stalls (one of which is arranged for the reception of violent cases) and six ordinary stalls. On the second floor are twelve boxes and stalls of various dimensions, a room for dogs containing about twenty kennels, a pharmacy, and an instrument room. The third story contains, besides the necessary lofts and work rooms, apartments for the assistant surgeon and house surgeons. In the basement there is a shoeing forge and a boiler

room. Hot and cold water, steam heat, electricity, and gas are supplied throughout the building, and all pains have been taken to make the drainage and ventilation satisfactory.

“Adjoining the Hospital and connected with it, is another brick building, erected entirely for the purposes of the School. This contains, on the lower floor, which is devoted to Hospital uses, boxes and stalls for ten horses. Upon the second floor is the lecture-room, in which a separate desk is provided for each student, and the seats rise each higher than the one before it. From this room a door communicates with the Hospital through which horses, or other animals, may be introduced for purposes of illustration. Upon the third floor in front is the dissecting-room, two stories in height, lighted from above, with an asphalt floor, and heavily painted brick walls, making a room which is at once light, well ventilated, and dry. In the rear is a student’s reading-room comfortably furnished, the walls being lined with book-cases which are intended to accommodate the library, to which the members of all the classes have access. Above this on the fourth floor is a museum, an anatomical demonstration room, and beside it a comfortable room for the house surgeons. The whole building is heated by steam. The forge is used for the shoeing of both sound and lame horses. The theory of orthopœdic shoeing will be taught as well as that of shoeing sound animals. It will be possible also for those students who desire it, to procure a course in practical horse-shoeing. Besides the rich collection at the Warren Museum, to which the students have access, the School has the nucleus of a valuable collection of its own, which has already been added to by gifts of anatomical and pathological objects from friends, both within and without the profession.”

This department, although still comparatively small in numbers, is effectively constituted and offers opportunities for the study of both the theory and practice of veterinary medicine which, it is believed, are as yet unapproached in the United States. It has thus far graduated thirty-nine Doctors of Veterinary Medicine, and it now has registered an equal number of candidates for its degree. The School is situated at the corner of Village and Lucas Streets, Boston.

## THE BUSSEY INSTITUTION.

The School of Agriculture and Horticulture is situated about five miles from the heart of the city on a farm of 200 acres in Jamaica Plain, a rural portion of the extended municipality of Boston. Instruction is given in agriculture, useful and ornamental gardening and stock-raising, and in botany and chemistry as applied to those arts. The students of the School include persons intending to become farmers, gardeners, florists, landscape gardeners, managers or stewards of large estates or public institutions, stock raisers, overseers of farms, and owners of rural property.

The admission requirements are nominal as regards students who do not purpose to become candidates for a degree. If the degree of Bachelor of Agricultural Science is desired, the candidate must spend one year at the Lawrence Scientific School or give evidence of having taken its equivalent elsewhere. He must also study one year at the Bussey Institution and later pursue at least one year of advanced study there or in other departments of the University, and pass examinations to determine the excellence of his work. Instruction is given by lectures and recitations, and by practical exercises in the laboratories, greenhouses, and fields; every student being taught to make experiments, study specimens, and observe for himself. The aim of the teachers is to give the student a just idea of the principles upon which the arts of agriculture and horticulture depend; to teach him how to make intelligent use of the scientific literature which relates to these arts; and to enable him to put a proper estimate upon those kinds of evidence which are obtained by experiments and by the observation of natural objects. The tuition-fee of \$150 is remitted in favor of students of limited means. Intelligent students in need of aid are permitted to work for their board and lodging. Those who pay the full fee may take courses in other departments of the University free of charge and enjoy the library and other privileges open to students in the Cambridge departments. The small number of students at this School assures to all the most careful personal attention.

The School building and grounds are situated upon high land commanding views of an attractive country. The groves and park-like plantations of the Arnold Arboretum adjoin and partly surround the land used by the School. Although so retired, the School is within easy reach of Boston with its libraries, museums, and galleries; and of Cambridge with its wealth of scientific apparatus.



## THE SUMMER SCHOOLS,

A week or more after Commencement and the departure of the great body of students, a number of short courses or schools are opened in the College buildings in Cambridge under the charge of instructors in the departments of chemistry, physics, botany, geology, bodily training, etc. These courses are largely attended by teachers in colleges and secondary schools; college students who are sufficiently in earnest in their studies to give half of their vacation to work, and other persons — women as well as men — who wish to avail themselves of the opportunity to use Harvard's wealth of apparatus in the weeks when it would otherwise be idle. The schools are gaining in numbers from year to year. The fees are small and the opportunities for individual progress under competent guidance are excellent. Detailed circulars concerning these schools are published early every spring and may be obtained from the Secretary. Each course lasts about six weeks, and occupies the whole time of its students during that period. The number of students in the summer schools of 1892 was 500.

During the summer of 1893 the following courses will be given : —

English, three courses, viz. : —

Rhetoric and Composition (two courses) : —

A. Elementary Course ;

B. Advanced Course.

Anglo-Saxon.

German, two courses.

French, two courses.

American History.

Draughting and Descriptive Geometry.

Trigonometry.

Engineering, three courses, viz. : —

Topographical Surveying ;

Railway Surveying ;

Electrical Engineering.

Physics, two courses.

Chemistry, four courses, viz. : —

Fundamental Principles of Chemistry ;

Qualitative Analysis ;

Quantitative Analysis ;

Organic Chemistry.

Botany, two courses, viz. : —

Vegetable Morphology and Physiology and Microscopical  
Anatomy of Phaenogams ;

Cryptogamic Botany.

Geology, three courses.

Physical Training, two courses.

Courses at the Medical School.

\* \* \* The course in the History and Art of Teaching omitted this year will  
be given in 1894.

## THE ASTRONOMICAL OBSERVATORY.

The Observatory is situated upon a small hill about half a mile northwest of the principal University buildings. Its grounds embrace  $7\frac{1}{2}$  acres and contain ten buildings belonging to this department. The main building includes the residence of the Director, the library, various computing rooms, the 15-inch and 6-inch equatorials and 8-inch transit circle. A two story and a half brick building, 30 by 60 feet, recently completed, contains the thousands of glass photographs and the more valuable manuscripts of the Observatory. It has convenient rooms for the examination and use of these records. One of the smaller buildings contains a photographic laboratory; the others contain apparatus, including photographic telescopes of the respective apertures 12, 11, and 8 inches, and reflectors of 28 and 15 inches in aperture. Nearly all the instruments are in constant use, two of the photographic telescopes being used throughout the whole of every clear night.

In addition to observations conducted in Cambridge, the Observatory has recently been maintaining a series of observations in Peru. The work undertaken there is designed to complete investigations begun at Cambridge by extending them to the parts of the sky invisible at northern stations. It includes photometric measurements of the light of the stars, photographic charts of their places, and photographs of their spectra.

The principal work of this department of the University is being done under the stimulating influence of four remarkable benefactions, — the bequest of Robert Treat Paine, now amounting to \$320,000; the bequest of U. A. Boyden, now amounting to \$214,000; the annual gift of \$10,000 by Mrs. Henry Draper; and the gift of \$50,000 by Miss Catherine W. Bruce. The Boyden Fund maintains a number of stations near Arequipa, Peru, at elevations of 100 feet, 4150 feet, 8060 feet, and 16,650 feet above sea level. At the third station a 13-inch telescope, an 8-inch telescope and a photographic camera having an aperture of  $2\frac{1}{2}$  inches, have been kept steadily employed of late with valuable results. The Henry Draper Memorial Fund is applied to stellar photography; part of the work being done in Arequipa, part in Cambridge. Miss Bruce's gift is for a photographic telescope, which when completed will be one of the most powerful astronomical instruments in the world. In several particulars it will be the most powerful. It is to be mounted at Arequipa, which is without question a singularly favorable place for observing;

and the rare combination of instrument, position, and ample means for prolonged and skilful observations are confidently looked upon as likely to produce remarkable results. It is hoped that the climatic advantages for astronomical work presented by this station, and the extensive field of usefulness open to large telescopes in the southern hemisphere may lead to the establishment at Arequipa of a telescope of the first class.

The reduction of the results of the observations in Cambridge and Peru employs a force of about thirty persons, and it is in computation and work upon photographic plates as well as in certain kinds of observing that approved students are sometimes employed under Professor Pickering's direction. Competent students needing pecuniary aid are given allowances varying from \$300 to \$500 a year for their services, but the work for which they are paid affords a low order of scientific training and leaves little time for other study.

The instruction in astronomy offered by the University is not given at the Observatory, but facilities are freely offered astronomers for making use of the Observatory library, buildings, grounds, and instruments so far as it can be done without interfering with regular work. Similar opportunities are sometimes offered to special students in astronomy, but the constant employment of the instruments greatly limits such use. Persons wishing to study astronomy in Cambridge, or to obtain employment at the Observatory in connection with their studies under the Faculty of Arts and Sciences, are advised to correspond with the Secretary several months before the opening of the academic year.



## THE UNIVERSITY LIBRARY.

The University Library contains about 412,000 bound volumes and over 300,000 unbound maps and pamphlets. It is the largest of the university libraries of the country. Its increase is rapid. It is not all grouped in Gore Hall, its main building, as volumes relating to professional work are placed in the professional school buildings, while many in immediate demand in the classical department, the department of philosophy, the department of history, and similar centres of activity are placed within easy reach of the class-rooms of those departments. The Library is conducted upon the most modern and approved methods, and its primary aim is to meet all immediate demands in the shortest possible time. It is catalogued by cards — first by authors, second by subjects. Delivery, considering the size of the collection and its steady and rapid growth, is singularly prompt. The possession of ample funds for the purchase of new books, as fast as needed for effective instruction, is one of the strongest features of the Library. Its total annual expenditures closely approach \$50,000. The efficiency of the Library management is shown by the number of those who use it and by the number of volumes lent. Twenty years ago only 57% of students in College used the Library, now over 90% of the upper classmen are borrowers. The elective system deserves a part of the credit for this increased use of original authorities. The mere note-taking or text-book studying student is now the exception where he used to be the rule.

The following tables show in detail some of the operations of the Library :

Department.	Volumes.	Pamphlets.
Gore Hall (College Library) . . . . .	301,252	287,556
Laboratory and Class-rooms . . . . .	8,504	. . .
Law School . . . . .	28,157	3,544
Scientific School . . . . .	3,355	800
Divinity School . . . . .	24,027	4,500
Medical School . . . . .	2,033	. . .
Museum of Zoölogy . . . . .	22,757	253
Astronomical Observatory . . . . .	7,187	8,569
Botanic Garden . . . . .	6,260	3,425
Arnold Arboretum . . . . .	4,000	. . .
Bussey Institution . . . . .	3,225	. . .
Peabody Museum . . . . .	1,243	1,352
Totals . . . . .	412,000	309,999

## ANNUAL INCREASE IN RECENT YEARS.

In 1879 . . . . .	10,389 vols.	In 1886 . . . . .	9,191 vols.
" 1880 . . . . .	7,247 "	" 1887 . . . . .	11,924 "
" 1881 . . . . .	9,804 "	" 1888 . . . . .	16,468 "
" 1882 . . . . .	9,192 "	" 1889 . . . . .	12,253 "
" 1883 . . . . .	9,818 "	" 1890 . . . . .	16,051 "
" 1884 . . . . .	12,360 "	" 1891 . . . . .	13,276 "
" 1885 . . . . .	14,558 "	" 1892 . . . . .	13,785 "

## USE OF THE GORE HALL LIBRARY.

	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.
1. Books lent out . .	60,195	62,861	65,639	68,892	74,906	70,036	71,434
2. Used in the building	8,816	12,041	15,267	14,299	17,203	15,861	19,648
Total . . . . .	69,011	74,902	80,906	84,191	92,109	85,897	91,082

## STUDENTS' USE OF THE GORE HALL LIBRARY.

STUDENTS OF	1886-87.		1887-88.		1888-89.		1889-90.		1890-91.		1891-92.	
	Whole No.	No. taking books.	Whole No.	No. taking books.	Whole No.	No. taking books.	Whole No.	No. taking books.	Whole No.	No. taking books.	Whole No.	No. taking books.
Divinity . . . . .	20	20	16	16	26	26	36	36	41	36	39	39
Law . . . . .	180	108	215	175	217	138	254	151	279	147	363	165
Scientific . . . . .	14	10	20	18	35	21	65	37	88	42	118	71
Resident Grad.	56	54	83	76	85	74	93	81	110	92	176	151
Senior Class . . . . .	239	231	237	234	214	206	278	254	289	260	271	251
Junior Class . . . . .	238	215	214	209	252	249	244	232	254	242	304	281
Sophom. Class . . . . .	224	206	281	234	264	238	282	253	289	245	331	274
Freshm. Class . . . . .	280	195	295	229	309	215	323	215	366	217	381	234
Sp. Students . . . . .	. . .	. . .	. . .	. . .	. . .	. . .	144	100	141	123	169	114
Totals . . . . .	1251	1039	1331	1191	1402	1167	1719	1359	1857	1404	2152	1580

## PERCENTAGE OF UNDERGRADUATES USING GORE HALL LIBRARY.

	1879-80.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.
Seniors . . . . .	88	90	90	92	96	99	97	91	89	92
Juniors . . . . .	83	88	93	96	90	98	99	95	95	92
Sophomores . . . . .	83	85	86	93	92	94	90	90	84	82
Freshmen . . . . .	65	80	80	78	69	77	69	67	59	61

The steady increase in the size and efficiency of department and class-room libraries is slightly reducing the relative number of students borrowing books from the main library in Gore Hall. None of the tables indicate the extent to which professional school, department, and laboratory libraries are used, and of course no record can be kept of the steady use of the periodicals, books of reference, and reserved books which are always within reach of the hundreds of students who read and study in Gore Hall.

## THE LABORATORIES.

The principal laboratories in Cambridge are the Boylston Chemical Laboratory, built in 1857, enlarged in 1870, and again remodelled in 1891: the Jefferson Physical Laboratory, completed in 1884 at a cost of \$115,000: the Psychological Laboratory in Dane Hall (described on page 23), the new Physiological Laboratory in the Lawrence Scientific School building: and the laboratories in the University Museum building, which include ample and separate accommodations for the departments of Zoölogy, Paleontology, Geology, Geography, Petrography, Mineralogy, and Botany. The portion of the Museum building occupied by the laboratories and lecture-rooms of these departments has a floor space of over an acre. The Peabody Museum contains a laboratory for anthropological and archaeological research. Boylston Hall now contains six large chemical laboratories and a number of private rooms for instructors. The largest working-room has places for 100 students. It is especially devoted to qualitative and descriptive work. That next in size has 64 places. In all 250 working tables are provided, of which one half are occupied by two students each, having separate lockers, and working at different hours. The new Boylston lecture-room has seats for 500 persons. The Jefferson Physical Laboratory is four stories high and 210 feet long. It has the most ample accommodations for both large and small classes, and for individual work, free from interruption. In the basement and first story stone tables resting upon separate columns of masonry furnish firm support for instruments in use. In the western end of the building a large rectangular tower stands on an independent foundation and has no contact with surrounding rooms. In it are conducted experiments requiring extraordinary stability or a great height — as for example, in Foucault's pendulum experiment. By a simple device nearly the entire length of the building may be used in experiments for testing the velocity of light. In the wing where magnetic experiments are tried there is no iron in the woodwork or masonry of the building. New apparatus is procured and the general running expenses of this Laboratory are in large part paid from a permanent income derived from invested funds.

The laboratories of the Medical, Dental, and Veterinary Schools, and the School of Agriculture and Horticulture, are of a size equal to the needs of those departments.



## THE MUSEUMS.

The magnitude of the museums of the University is illustrated by the fact that the University Museum alone contains four acres of floor space. It includes the Museum of Comparative Zoölogy, Natural History Laboratories of Zoölogy, Paleontology, Geology, and Geography, and the Museums of Mineralogy and Botany. The portion of the building devoted to Comparative Zoölogy and the laboratories named cost \$450,000. The section occupied by the Botanical Museum cost \$75,000 and that occupied by the Mineralogical Museum \$50,000.

The original scheme for this Museum was proposed by Professor Louis Agassiz in 1859. Its realization is in great part the work of his son Alexander Agassiz, the present Curator of the Museum.

In an adjoining building, having a floor area of 29,828 square feet (not including basement and attic), are the Peabody Museum of American Archaeology and Ethnology, and the Semitic Museum. The latter will in time be removed to other quarters. The Fine Arts collections are in part in the rooms of the department of Fine Arts in Sever Hall and in part in the Museum of Fine Arts, Copley Sq., Boston. Thanks, however, to a bequest of over \$200,000 made by Mrs. Elizabeth Fogg of New York, the William Hayes Fogg Memorial Art Museum is soon to be erected in the College yard in close proximity to Appleton Chapel, Thayer Hall and Holworthy Hall. The building will contain not only exhibition rooms of generous size, but also lecture halls and drawing rooms for the department of Fine Arts. Over 400 students received instruction in this department in 1891-92.

The collection of coins and medals belonging to the University is kept in Gore Hall. The Anatomical Museum is placed in the Medical School building on Boylston St., Boston. The Museum of the Dental School is in the School building on North Grove St., and that of the School of Veterinary Medicine is in the Veterinary Hospital building on Village St., Boston. The Arboretum Museum has been placed in the new Hunnewell building. The actual cost of the collections in the Museum of Comparative Zoölogy has been over \$350,000. The collections are in part open to the public. The first of the exhibition-rooms open to the public is the Synoptic Room, in which the entire animal kingdom is summarized in a compact collection of distinctive types. Beyond this are the systematic collections of Mammals, Birds, Reptiles, Fishes, Mollusks, Crustacea and Insects, Radiates, Sponges, and Protozoa. Finally, there are the rooms

devoted to faunal areas, including those of North and South America, Europe, the Indo-Asiatic, the African, the Australian, and the Atlantic. The larger parts of the collection are not open to the public, but are in constant use by officers or competent students of the University engaged in research.

The collections in the Botanical Museum are not fully arranged and are open to the public only in part. They are of two kinds, the Economic Collection and the Ware Collection of glass models.

The Economic Collection will contain wood, fruits, fibres, etc. It is receiving from time to time large accessions from all parts of the world, and before long a portion of the most characteristic specimens will be placed upon exhibition. The collection of Fossil Plants, extremely valuable on account of its possession of types and from its richness and wide range, is at present stored in the commodious basement, but no attempt will be made to exhibit any of these specimens until the Economic Collection has been partially arranged.

The Ware Collection of glass models of flowers occupies the central room of the Museum. The exquisite models are made exclusively for this University by two European artists, father and son, named Blaschka. Their process is a secret. The collection now comprises illustrations of more than three hundred species, together with their analytical details, magnified in such manner as to display all structural features in a perfect manner. During the late winter one of the artists, Rudolf Blaschka, made a journey to the tropics and brought back more than a hundred elaborate drawings and other materials for illustrating the more useful plants of hot climates. A little later, he went to Arizona where he examined with the same degree of care the peculiar plants of the desert, then visited California, and returned overland by the way of Colorado, with his portfolio filled with characteristic drawings to be utilized in further modeling. These two artists prepare on an average one hundred models of large size, and three hundred models of details, each year. Their marvelous skill and accuracy are equalled only by the untiring assiduity with which these productions are made.

The Mineralogical Collections are in part open to the public. The public portions — about one half in amount — are large enough fully to illustrate the extent, beauty, and variety of the mineral kingdom. Some portions are systematic in arrangement: others are grouped to illustrate striking characteristics of minerals — lustre, for example. The collection of meteorites is one of the finest in existence. The portion of the collections not open to the public consist of systematic series grouped for specific and comparative study, and duplicates and class-room material continually being used and replaced. The value

of this collection is great. The meteorites alone represent over \$30,000; the whole collection, \$150,000. In 1892, Mr. James A. Garland of New York, presented the Museum with crystals of topaz, aqua marine, golden beryl, Mexican, Australian, and Hungarian opals, and platinum in the gangue; a diamond crystal an inch and a quarter in diameter, weighing nearly 90 carats; and the Hamlin Collection of tourmalines. His gift, measured in money, is equivalent to at least \$20,000.

The Peabody Museum is open to the public. It contains large archaeological and ethnological collections obtained by systematic and thorough explorations of burial-places, caves, shell-heaps, village-sites, mounds, and ruins in many parts of North, Central, and South America, as well as by extensive examinations of gravel beds, peat bogs, and river and other deposits of various geological ages. By the arrangement in the Museum of these special collections in their geographical sequence, each tells its own story in all its details.

For a comparative study of the archaeology and ethnology of other parts of the world two rooms are devoted to collections arranged ethnographically. There is also a large anthropological collection, including over two thousand human crania and many more or less complete skeletons. The Curator of the Museum, Professor Frederick W. Putnam is at present in charge of the great archaeological exhibit at the World's Columbian Exposition.

The Semitic Museum, founded by Mr. Jacob H. Schiff in 1889, occupies temporary quarters in the new part of the Peabody Museum. Its aim is to furnish materials for illustration of the Semitic instruction given in the University and for original investigation, and also to show to the general public, the place which belongs to the Semites in the history of culture. The collection embraces casts of many of the most interesting Semitic monuments in the British Museum, the Louvre, and the Berlin Museum. Among these are Assyrian bas-reliefs from Ninevah and Kalah; Babylonian statues from Tello; and Phœnician, Hebrew, Moabite, Arabic, Punic, Hittite and Persian monuments, bas-reliefs, and inscriptions. It contains also manuscripts, Arabic, Hebrew, and Syriac, and a large number of photographs illustrating ancient and modern Semitic life, art, and scenery. There are many original clay tablets from Babylon, some of which are of great interest, and also Semitic coins and other objects illustrating the life of the people. It is intended to make the collection as complete as possible in material from Palestine illustrating Hebrew history.



## BOTANIC GARDEN, HERBARIA, AND ARBORETUM.

The Botanic Garden and greenhouses occupy about seven acres of land opposite the Observatory grounds. About 6000 species of flowering plants are grown for educational purposes, supplying students of Botany who are members of the University with abundant material for determination or investigation. The Botanical library of 9800 volumes and pamphlets and the University Herbarium are contained in one of the buildings in the Garden. The Herbarium contains five hundred thousand specimens which are open, under the direction of the Curator, to qualified and properly registered students. The accessions to the Herbarium in 1889-90 illustrate the direction and the rapidity of its growth. They included 850 specimens from Northern Mexico, embracing many new and little-known species; 575 from Canada; 600 from Porto Rico; 670 from Bolivia; 700 through the Director of the Kew Gardens, mainly from China, Tasmania, and Brazil; 126 from Arabia Felix; 300 from South Africa; 240 from Australia; the entire Thomas P. James collection of mosses, and a large part of the George Thurber collections. In 1891-92 13,000 sheets of specimens were inserted in the Systematic Collection. It is not, however, the number of specimens which make the Gray Herbarium of national value. It is the accuracy with which its specimens have been identified and the fact that many of them are types from which new species have been described and named. Drs. Asa Gray and Sereno Watson alone described 2500 new species, mainly American plants, and the type specimens of all of them are in this Herbarium. This collection is by far the richest in America.

The Herbarium of Cryptogamic Botany is placed in the University Museum in connection with the Botanical Museum. It contains several hundred thousand specimens, including the Tuckerman collection of lichens, having about 75,000 specimens; the Curtis collection of fungi, about equal in magnitude; and the Farlow collection of algae, lichens, and fungi. Competent students who are not members of the University may obtain permission to use the Herbarium under proper supervision.

The Arnold Arboretum occupies a portion of the Bussey Farm, 160 acres in extent, in that part of Boston known as West Roxbury. It was founded as an out-door museum of trees and shrubs suited to the climate of Massachusetts.

These trees were to be arranged in the sequence of natural classification, to be properly labeled, and accessible to the public by means



of roads and paths, each species being represented by typical specimens and by its natural and artificial varieties. They were to be planted in such a way as to harmonize with such portions of the existing woodland as it had been considered desirable to preserve, the whole being arranged in accordance with the principles of landscape art. A second object of the Arboretum was the formation of a dendrological museum, herbarium, and library, and the dissemination — by means of publication, to students, and the distribution of plants and seeds — of the results of studies and experiments.

By a mutually beneficial compact between the University and the City of Boston, the latter acquired a most important addition to its park system in return for the construction of three miles of roads opening the Arboretum ground and collections to easy inspection. The planting of the specimen trees has proceeded as fast as the operations of road construction would allow, and now two thirds of the whole Arboretum is permanently planted and recorded.

Through the gift of Mr. H. H. Hunnewell, the Arboretum has now a museum building admirably suited to its needs, which will greatly facilitate the scientific work to be carried on hereafter. It is a substantial fireproof structure one hundred feet by forty, conveniently situated near one of the principal entrances. The lower story, consisting of two large rooms, is devoted to a museum of dendrology. On the upper floor are two rooms for the herbarium and the library, and several smaller working-rooms and offices. The herbarium, which is restricted to ligneous plants, now contains about 18,000 sheets, and is growing rapidly. The library is the gift of the Director, Professor Sargent, who has been collecting it with great care and judgment for many years. It numbers about 4000 bound volumes, and contains many rare and valuable works on general botany, dendrology, and forestry.

The journal *Garden and Forest*, founded and conducted by the Director, has been the principal channel through which the researches carried on at Arboretum have been published. Its influence in popularizing the knowledge of trees and their cultivation has been widely felt. That magnificent work *The Silva of North America*, now appearing in parts also bears witness to the Director's tireless activity in scientific work. Popular courses of lectures on trees and shrubs are now given in the spring and autumn, and are well attended. The constant distribution of plants and seeds by exchange and otherwise has been the means of introducing many valuable plants into cultivation. Any one qualified to pursue the study of practical arboriculture or forestry may be admitted to the Arboretum as a student.

## THE RELIGIOUS EXERCISES OF THE UNIVERSITY.

Harvard University is in the broadest possible sense unsectarian. Its officers, graduates, and students include persons of every shade of belief. All its religious exercises are voluntary. Compulsory attendance at morning prayers was abolished in 1886, and the effect of the change has been good. The regular services are held on Sunday evenings, every week-day morning in term-time between the breakfast hour and the beginning of lectures, and on Thursday afternoons during the winter. These services are conducted by the Plummer Professor of Christian Morals, assisted from time to time by five preachers to the University, who are appointed annually by the Governing Boards. The preachers who have been thus appointed since 1886 are: —

Right Rev. Phillips Brooks, D.D.  
Rev. Edward Everett Hale, D.D.  
Rev. Alexander McKenzie, D.D.  
Rev. Theodore C. Williams, S.T.D.  
Rev. George A. Gordon, A.B.  
Rev. Professor William Lawrence, S.T.D.  
Rev. Lyman Abbott, D.D.  
Rev. Professor C. C. Everett, D.D.  
Rev. Brooke Herford, D.D.  
Rev. Henry Van Dyke, D.D.  
Rev. Leighton Parks, D.D.  
Rev. E. Winchester Donald, D.D.  
Rev. Washington Gladden, D.D.

Every day during term-time the Preacher to the University, conducting services for the time being, receives, at stated hours, members of the University who desire advice or aid. The many hours occupied by these interviews are counted by both parties to them as productive of great and lasting good. A portion of the time the Sunday evening services are conducted by invited clergymen from various parts of the country, who are chosen on account of their recognized leadership in their localities and denominations.

The Preachers to the University publish a brief pamphlet describing the religious work of the year, which may be obtained on application. It bears witness to the fact that religious life in the University is healthy and active.

In the Harvard Divinity School weekly debates and conferences are held on Wednesday afternoons, and preaching services on Friday evenings.

During the academic year 1891-92 a series of Tuesday evening College Conferences on the literary, ethical, and religious aspects of the Bible were held. Among the subjects chosen were the following: "The Literary Aspect of the English Bible," Professor Kittredge; "The Bible and the Sacred Books of the East," Professor Everett; "The Bible in its Relation to Modern Problems," Rev. Lyman Abbott; "The Development of the Hebrew Religion," Professor Toy.

Among the subjects of the Conferences in 1888 and 1889 were the following: "College Responsibility," Rev. Phillips Brooks, D.D.; "College Public Opinion," President Eliot; "The Recovery of Religious Enthusiasm," Rev. Professor Tucker of Andover; "The Belief in Immortality," Rev. Professor Everett; "Public Life," Hon. Theo. Roosevelt of New York; "Problems of Charity in a Large City," A. T. White, Esq., of Brooklyn, N. Y.; and a series of addresses on "The Choice of a Profession" by eminent members of the various learned professions.

The religious societies of the University are the Harvard Y.M.C.A. (formerly known as the Society of Christian Brethren), the St. Paul's Society, the Oxford Club, the Harvard Religious Union, and the Harvard Catholic Association. They have numerous members. Many members of the University engage actively in charity work in Boston and Cambridge, fields in which ample opportunity is offered for effort of this kind.

There are in Cambridge or its immediate vicinity theological seminaries of at least five of the leading evangelical denominations.

In addition to the opportunities for voluntary worship in the University Chapel, seats are provided for students, at the expense of the College, in many churches of different denominations situated near the College buildings.

The following extract from a magazine article published recently by a young man who came to Harvard from another college, illustrates student opinion of the moral condition of the University: "It is only the outgrowth of tendencies planted in the school and the home. If boys come from sensible homes and schools to Harvard, they will find it a place unexcelled in developing influences and opportunities. In every case the choice of what the man will be must rest with the man himself."

## UNIVERSITY RECEIPTS AND EXPENSES.

In round numbers a million dollars is received and expended on account of Harvard University each year. In 1891-92 the total amount of income, excluding gifts not for immediate use, was \$1,047,382.84, and the total amount of expenses was \$981,182.79. The following table shows the sources from which the year's income was derived:—

### INCOME.

Interest on Notes, Mortgages, Bonds, etc., . . . . .	\$198,870.85	
Dividends on Stocks, . . . . .	29,928.00	
Rents from Real Estate, . . . . .	214,877.13	
Term Bills:		
Students in Arts and Sciences, . . . . .	302,432.30	
"    "    Divinity, . . . . .	5,623.82	
"    "    Law, . . . . .	53,100.60	
"    "    Medicine, . . . . .	81,985.77	
"    "    Dental Medicine, . . . . .	8,246.67	
"    "    Veterinary Medicine, . . . . .	3,431.00	
"    "    the Bussey Institution, . . . . .	1,246.00	456,065.56
Laboratory Fees, Sales, and Sundries, . . . . .	71,478.48	
Gifts for immediate use, . . . . .	76,162.82	
		<u>\$1,047,382.84</u>

The gifts for the year, exclusive of those for immediate use, amounted to \$440,369.38.

The following table shows the expenses for the year:—

### EXPENSES.

#### University.

Salaries and other expenses, . . . . .	\$63,093.23	
Insurance, Taxes, Repairs, etc., . . . . .	59,502.28	
Incidental Trusts, . . . . .	13,132.42	\$135,727.93

#### College, Scientific, and Graduate Schools.

Salaries for instruction, . . . . .	216,637.97	
General expenses, . . . . .	80,237.38	
Collections and Laboratories, . . . . .	17,881.94	
Fellowships and Scholarships, . . . . .	43,195.02	
Beneficiaries, . . . . .	18,232.56	
Prizes, . . . . .	1,984.78	
Scientific School salaries and expenses, . . . . .	35,978.94	
Summer School salaries and expenses, . . . . .	8,224.19	422,372.78

Amount carried forward, . . . . . \$558,100.71



Amount brought forward, . . . . .		\$558,100.71
<b>Divinity School.</b>		
Salaries and other expenses, . . . . .	25,682.18	
Scholarships and Beneficiaries, . . . . .	1,935.00	27,617.18
<b>Law School.</b>		
Salaries and other expenses, . . . . .	49,427.90	
Scholarships, . . . . .	1,650.00	51,077.90
<b>Medical School.</b>		
Salaries and other expenses, . . . . .	72,211.15	
Scholarships and Beneficiaries, . . . . .	2,062.50	74,273.65
<b>Dental School.</b>		
Salaries and other expenses, . . . . .		11,678.91
<b>School of Veterinary Medicine.</b>		
Salaries and other expenses, . . . . .		25,637.45
Bussey Institution, . . . . .		12,354.00
Arnold Arboretum, . . . . .		49,866.58
Botanic Garden and Botanic Museum, . . . . .		9,778.75
Herbarium, . . . . .		5,314.68
Jefferson Physical Laboratory, . . . . .		3,485.69
Museum of Comparative Zoölogy, . . . . .		29,871.77
Astronomical Observatory, . . . . .		56,713.10
University Chapel, . . . . .		8,441.06
<b>University Library.</b>		
Books, . . . . .	16,566.73	
Salaries and other expenses, . . . . .	30,272.66	46,839.39
<b>Hemenway Gymnasium and Carey Building, . . . . .</b>		10,131.97
		<u>\$981,182.79</u>

Omitting the gifts to be held permanently in trust (\$440,369.38), but including the gifts for immediate use (\$76,162.82), the receipts for 1891-92 exceeded the expenses by \$98,027.50, and this sum represents consequently the net increase for the year in the invested funds and balances. Of this increase an important part went to funds which under the terms of their trusts are held for accumulation. For example the Retiring Allowance Fund, some day to be used for pensioning aged professors, increased over \$13,000, and sundry scholarship funds increased over \$4,000. In general, it may be remarked that the tuition fees paid by students fall far short of being sufficient to pay for the instruction and other advantages given them; that the salaries paid to professors and other teachers are much below what they should be, and that, in spite of its large income, Harvard University, by reason of its manifold and costly undertakings, is never free from embarrassment due to insufficiency of income.

## UNIVERSITY BUILDINGS AND GROUNDS.

Aside from property held for investment purposes, Harvard University owns and occupies over sixty buildings and nearly seven hundred acres of land. This property is partly in Cambridge on the northern side of Charles River, and partly in Boston and the outlying wards of Boston still popularly known by their old town names of Brighton and Jamaica Plain. The following is a list of the principal buildings occupied by the University, not including any modern structure whose cost has been under \$5,000:—

NAME.	PURPOSE.	DATE.	COST.*
Massachusetts . . . . .	Lecture-rooms	1718-20	£3,500
Wadsworth . . . . .	Dormitory and offices	1726	£1,800
Holden . . . . .	Lecture-room	1744	£400
Hollis . . . . .	Dormitory	1763	£4,800
Harvard . . . . .	Lecture-rooms	1764-66	\$23,000
Stoughton . . . . .	Dormitory	1805	23,700
Botanic Garden Buildings	Gardens, hothouses, and herbarium	1810-79	55,000
Holworthy . . . . .	Dormitory	1812	24,500
University . . . . .	Lecture-rooms and offices	1814-15	65,000
Divinity Hall . . . . .	Dormitory	1826	31,500
Divinity House . . . . .	Dormitory	1826	2,900
Dane . . . . .	Lecture-rooms and Coöp.-stores	1832-91	24,000.
Gore . . . . .	Library	1837-77	165,000
Observatory Buildings	Astronomical observations	1844-92	50,000
College House . . . . .	Dormitory	1846-71	59,000
Dental School . . . . .	Lecture-rooms and laboratories	1846-71	21,000
Lawrence . . . . .	Scientific School	1848-71	43,000
Boylston . . . . .	Chemical laboratory	1857-91	77,000
Appleton . . . . .	Chapel	1858-73	84,000
University Museum . . . .	Nat. hist. museums and laboratories	1859-91	600,000
Old Gymnasium . . . . .	Carpenters' shops	1860	9,500
President's House . . . . .	Official residence	1860-61	16,500
Grays . . . . .	Dormitory	1863	39,500
Thayer . . . . .	Dormitory	1870	100,000
Holyoke . . . . .	Dormitory	1870-71	126,000
Bussey School Buildings	Lecture-rooms, &c.	1872-72	60,000
Memorial Hall . . . . .	{ Auditorium, dining hall, and memorial transept }	1870-76	422,000
Weld . . . . .	Dormitory	1872	87,000
Matthews . . . . .	Dormitory	1872	113,000
College Hospital . . . . .	Hospital	1874-75	3,500
Univ. Boat Club House	Athletic sports	1874-77	6,000
Peabody Museum . . . . .	Archaeology and ethnology	1876-84	116,000
Hemenway Gymnasium	Athletic sports	1878-79	103,000
Sever . . . . .	Lecture-rooms	1878-80	117,000

\* Approximate and inexact.

NAME	PURPOSE.	DATE.	COST.*
Medical School Building	Lecture-rooms and laboratories	1881-83	\$240,500
Austin . . . . .	Law School	1882-83	154,000
Jefferson . . . . .	Physical laboratories	1883-84	117,000
Veterinary School Bldgs.	Hospital, lect.-rooms, and laborat's	1882-84	15,000
Divinity Library . . . .	Library	1887	42,000
Carey Athletic Building.	Athletic sports	1889-90	38,500
Walter Hastings . . . .	Dormitory	1888-89	243,000
Weld Boat House . . . .	Athletic sports	1888-89	. . .
Sears Laboratories . . . .	Laboratories	1889-90	36,000
Foxcroft House . . . .	Dormitory and dining hall	†1888-89	‡23,275
Johnston Gateway . . . .	Main entrance to Yard	1890	11,500
Rotch Elect. Workshop . .	Laboratory	1891-92	11,000
Hunnewell Building . . .	Arboretum museum	1892	30,000

The land owned and occupied by the University amounts in all to 691.74 acres, as follows:—

	ACRES.
College Yard . . . . .	22.70
Holmes Field, including Jarvis Street, Hastings Hall, Gymnasium, and Lawrence Scientific School. . . . .	15.80
Jarvis Field . . . . .	5.08
University Museum and Divinity lot. . . . .	12.12
Observatory grounds . . . . .	7.50
Botanic Gardens . . . . .	7.90
Other Cambridge lands . . . . .	7.60
Soldier's Field . . . . .	34.40
Longfellow Park . . . . .	68.10
Arnold Arboretum . . . . .	160.00
Bussey lands . . . . .	240.00
Lands in Dedham . . . . .	51.00
Lands in Hyde Park and Ward's Island . . . . .	38.50
Medical and Dental Schools . . . . .	1.04
Stoughton land . . . . .	20.00
Total . . . . .	691.74

Twenty-one buildings already occupy places in the College Yard; nine others stand upon Holmes Field, nine upon the Observatory land, three in the Botanic Garden, and twelve upon other Cambridge lands. During the summer of 1893 work will be begun upon an Art Museum to cost \$150,000, an addition to Gore Hall to cost between \$150,000 and \$200,000, and upon two new dormitories to cost \$250,000.

These will all be placed upon Cambridge land. The number of buildings on land in Boston is eleven. None of these statements have reference to land or buildings held for purposes of investment merely, although the value of such real estate is nearly three million dollars.

\* Approximate and inexact.

† Date of purchase.

‡ House and land.

## THE LECTURE-ROOMS AND THEIR USES.

All the Professional Schools of the University have separate buildings devoted exclusively to their own use, and their buildings have ample lecture-room accommodations. The Lawrence Scientific School has a building of its own containing 19 lecture-rooms and work shops. Its students also work much of their time in the laboratories and museums. The College and Graduate School together occupy lecture-rooms in nine buildings, 80 rooms in all being in constant use. A few of these rooms seat between four and six hundred students at once, but most of them are adapted to classes of 20, 40, 70, or 125 each. Small classes are one feature of the elective system. The largest of the lecture-halls of the University is Sanders Theatre, which seats 1400 persons. The Commencement-Day exercises are held in it, as well as many evening concerts, lectures, and readings.

The number of evening lectures, seminary meetings, conferences, concerts, and readings is large, students often having their choice, in a single evening, of four or five such auxiliaries to regular work. The lecturers, while often members of one of the University Faculties, are quite as likely to be distinguished visitors from abroad or from some other centre of American culture. Most of the speakers come as the guests of student literary or scientific societies, but the University often invites eminent scholars to deliver courses of public lectures. A series of eight instrumental concerts is given each winter, in Sanders Theatre, by the Boston Symphony Orchestra. The best music is performed at these concerts. During each recent winter the number of public evening lectures and similar appointments in the University lecture-rooms has been over a hundred, the audiences in many instances exceeding a thousand.

Societies which are representative of student activity in economic, literary, scientific, musical, or religious ways make frequent evening use of the lecture-rooms at the times of their stated meetings. It is the policy of the University to allow the free use of its rooms by student societies which are not simply social in their character, or unrepresentative in their membership. As a majority of the evening lectures and concerts in the College buildings are open to the public as freely as to students, the families of teachers and students enjoy these special advantages with them.



## THE ATHLETIC BUILDINGS AND FIELDS.

The University has four buildings devoted wholly to athletic purposes — the Hemenway Gymnasium, the Carey Athletic Building, the University Boat House, and the Weld Boat House. The Hemenway Gymnasium, built in 1879, has — allowing for the reasonable coming and going of individuals — accommodations for between 2000 and 3000 students. As regards size, strength, and variety of its apparatus and completeness of its appointments, the Gymnasium supplies every desire of the indoor athlete. For members of the University and class crews, nines and elevens, the Carey Athletic Building, having a floor area of 7848 square feet, gives peculiar accommodations. For the crews there is a tank containing a fixed boat, around which passes a current of water. For the nines there are rooms in which indoor practice in pitching and batting is made easy. Early in the autumn the eleven use a room with an earth floor, which gives opportunities for drill in dodging, tackling, and passing the ball. The same room is available for practice in jumping, vaulting, and similar exercises. Of the two boat-houses, the University is for the regular crews, and is arranged to hold their long shells used in races. Its floor space is 6893 square feet. The Weld Boat House is for the use of any students who enjoy rowing. It contains boats of various kinds sufficient for 300 persons. All students using the athletic buildings are closely supervised and allowed to take only proper kinds and amounts of exercise. The Director of the Gymnasium is a physician and an expert in physical development. The outdoor sports of the students requiring fields for play are accommodated on Jarvis Field (five acres), Holmes' Field (five acres), Norton Field (seven acres), and the new Soldier's Field (twenty-seven acres). The latter has sufficient area graded and turfed to meet the demands of a very large number of students, and when the large fund recently raised by graduates and students to improve it is expended, it will be without a rival among the athletic fields of this country. The athletic fields now in use have stands and benches erected around them sufficient to seat about 8000 persons.

The Soldier's Field was given to the University in 1890 by Major Henry L. Higginson of Boston in memory of friends who served in the Civil War. In a short time it will become the principal athletic field of the students. It is situated on the south side of the Charles River, opposite Old Cambridge, and adjoins the extensive marshes once owned by Mr. Longfellow and given by him to the University.

## PRIZES.

The money prizes offered annually in the various departments of the University amount to \$2655. They are as follows : —

Nine Bowdoin prizes, varying from \$50 to \$100 each, for dissertations upon announced economic, classical, or scientific subjects, or for translations of set passages of English into Latin or Greek prose. These are open wholly or in part to students in the Graduate School, the College, the Scientific School, and other parts of the University.

Five Boylston prizes, three of \$45 each and two of \$60 each, for excellence in elocution, open to Seniors and Juniors in the College.

The Sargent prize of \$100, for the best metrical translation of an ode of Horace, open to students in the undergraduate department.

The Sumner prize of \$100, for the best dissertation on a subject connected with the topic of Universal Peace, open to all departments.

The Toppan prize of \$150, for the best essay on a selected subject in Political Science, open to graduates of three years' standing and to students in the Graduate and Professional Schools.

The Chauncey Wright prize of \$25, for the best mathematical thesis on an announced subject, open to Juniors, Seniors, and graduates.

The Dante prize of \$100, for the best essay on a subject drawn from the life or works of Dante, open to students in any department and to graduates of not more than three years' standing.

The George B. Sohler prize of \$250, for the best thesis presented by an approved candidate for Honors in English or modern literature.

The Paine prizes, two of \$100 each, for the best essays by any students of the University on the ethical aspect of social questions ; for example, labor problems, productive coöperation, etc.

The Harvard Law School Association prize of \$100, for the best essay upon a selected subject in law, open to third-year students in the Law School and to members of the class last graduated.

The Boylston Medical prizes, two prizes of \$100 or \$200 each, upon announced subjects in medical science, open to public competition.

The Porter prize of \$50, for the best dissection deserving the award illustrative of surgical anatomy, open to members of the Medical School and graduates of not more than five years' standing.

The Otology prize of \$25, for the best preparation illustrating the osseous anatomy of the ear, or for the best thesis showing original work on an otological subject, open to third-year students in the Medical School.

## CONCLUSION.

This brief survey has shown that Harvard University with its large corps of instructors, its collections of books, apparatus, and scientific material, its activity in the general advancement and diffusion of knowledge, its ability and readiness to aid the poor but promising student, its hospitality towards all scholars, no matter what their race or creed, is in fact a true University.

Although age is too apt to breed unwise conservatism, this University is more frequently assailed for its spirit of progress, and its willingness to break with precedent for the sake of truth, than it is for its attachment to venerable tradition. It has done its part in making the degree of Bachelor of Arts a broader and a higher title. It has increased the significance of the degrees of Master of Arts and Doctor of Philosophy, and it has been prudent in its bestowal of honorary degrees. Having for twenty years steadily increased the severity of its requirements for admission and for graduation, it is not unwilling to permit capable students to compress somewhat the terms of residence ordinarily required for the degree of Bachelor of Arts, in order that more young Americans may seek the degree of Bachelor of Arts, and that the professional degrees and the degrees of Master of Arts, Doctor of Philosophy, and Doctor of Science may be taken less late in life by college graduates. Not a few who are able to meet in full the requirements for the first degree in three years or three years and a half are allowed to do so. All who aim to become teachers are encouraged to secure either the Master's degree or the degree of Doctor of Philosophy.

In 1871 Harvard University included 1149 students and 116 teachers. In 1893 it includes 2966 students and 294 teachers. There is reason to suppose that this rate of increase may be maintained. The authorities of the University desire it; the alumni are believed to be ready to provide such additional endowments as may be needed, and the public is alive to the fact that more is to be gained by expanding an existing institution of merit than by multiplying poorly equipped schools. Harvard's equipment is capable of serving many more advanced students than now use it. Such students, if qualified for advanced work, are welcome not only in the departments of Philology, Literature, Political Science, Mathematics, and Philosophy, but also in the scientific work-shops of the University — the Observatory, the Museums, the Herbaria, and the experimental rooms of the laboratories.

Table of Schools and Colleges from which young men actually entered Harvard College from 1881 to 1890 inclusive, with the number that entered from each institution in each year. Special students are not included. An asterisk (\*) indicates a public school, a dagger (†) an endowed school.

	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Acadia College, Wolfville, Nova Scotia . . . . .	2	1	.	1	.	.	1	1	1	1
†Adams Academy, Quincy . . . . .	12	13	19	11	1	2	10	2	9	2
Adelbert College of W. R. Univ., Cleveland, O. . . . .	.	1	.	.	.	.	.	.	.	1
†Adelphi Academy, Brooklyn, N. Y. . . . .	.	.	.	1	1	1	.	.	.	.
†Albany, N. Y., Academy . . . . .	.	.	.	1	.	.	.	2	2	.
*Albany, N. Y., High School . . . . .	.	1	1	.	.	.	.	.	.	.
Albion College, Mich. . . . .	.	.	.	.	.	.	.	1	.	.
Alfred, N. Y., University . . . . .	.	.	1	.	.	.	.	.	.	.
Amherst College . . . . .	1	.	.	1	2	1	.	1	3	.
Andover Theological Seminary . . . . .	.	.	.	.	1	.	.	1	1	1
*Arlington, Cotting High School . . . . .	1	1	1	2	2	.	.	2	.	3
Atlanta University, Georgia . . . . .	.	.	.	.	.	.	.	.	.	1
*Auburn, Me., Edward Little High School . . . . .	.	.	.	.	.	.	1	.	.	.
*Auburn, N. Y., High School . . . . .	.	.	.	.	.	.	.	1	.	.
*Augusta, Me., Cony High School . . . . .	.	.	.	.	.	1	.	.	.	.
Augustana College, Rock Island, Ill. . . . .	.	.	.	.	1	.	.	.	.	1
†Barre Academy . . . . .	1	.	.	.	.	.	.	.	.	.
Baughers Academy, Hanover, Pa. . . . .	.	.	1	.	.	.	.	.	.	.
Belmont School, Belmont, Cal. . . . .	.	.	.	.	4	2	.	1	.	.
Belmont School, Belmont, Mass. . . . .	.	.	.	.	.	.	.	.	2	.
Berkeley Gymnasium, San Francisco, Cal. . . . .	.	.	1	.	.	.	.	.	.	.
Berkeley School, Boston . . . . .	.	.	.	1	.	1	1	5	3	.
Berkeley School, New York . . . . .	1	.	1	.	6	2	6	4	4	1
Berkeley School, Providence, R. I. . . . .	.	.	.	.	.	.	.	1	.	.
†Berwick Academy, South Berwick, Me. . . . .	.	.	.	.	.	.	.	.	.	1
Bethany College, W. Va. . . . .	.	.	.	1	.	.	.	.	.	.
Boston College . . . . .	.	.	.	.	.	.	.	.	1	.
*Boston English High School . . . . .	.	.	.	.	.	4	5	4	7	.
*Boston Latin School . . . . .	17	17	20	21	17	25	31	25	28	25
Boston University . . . . .	.	.	.	1	.	2	1	.	4	.
Bowdoin College, Brunswick, Me. . . . .	.	.	.	.	.	.	.	.	.	1
†Brackett Academy, Greenland, N. H. . . . .	.	1	.	.	.	.	.	.	.	.
*Bridgewater High School . . . . .	2	.	.	.	.	.	.	.	.	.
†Bristol Academy, Taunton . . . . .	1	1	3	.	3	.	.	1	.	.
†Bromfield School, Harvard . . . . .	.	.	.	1	.	.	.	.	.	.
*Brookfield High School . . . . .	.	.	1	.	.	.	.	.	.	.
*Brookline High School . . . . .	2	2	.	.	.	2	.	.	4	.
Brooklyn, N. Y., Latin School . . . . .	.	.	.	.	.	.	.	.	.	2
Brown, H. H., Private School, Philadelphia, Pa. . . . .	.	1	.	.	.	.	.	.	1	.
Brown University, Providence, R. I. . . . .	.	1	.	1	.	.	.	.	1	1
Browne & Nichols, Private School, Cambridge . . . . .	.	.	.	1	3	3	6	11	6	.
Bucknell University, Lewisburg, Pa. . . . .	.	.	.	.	.	.	.	1	.	.
*Buffalo, N. Y., High School . . . . .	.	1	.	1	.	.	.	.	2	.
Buffalo, N. Y., Latin School . . . . .	.	.	.	2	1	.	.	1	1	.
*Buffalo, N. Y., State Normal School . . . . .	.	.	.	.	.	.	1	.	.	.
†Burr & Burton Seminary, Manchester, Vt. . . . .	.	.	.	.	.	.	.	.	1	.
*Cambridge Latin School . . . . .	11	8	8	5	11	14	4	14	14	13



	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Carleton College, Northfield, Minn. . . . .	.	.	.	.	.	.	.	.	1	2
*Castine, Me., High School . . . . .	.	.	1	.	.	.	.	.	.	.
Centre College, Danville, Ky. . . . .	.	.	.	.	.	.	1	.	.	.
Chadwick & Pye, Boys' Prep. Sch., Brooklyn, N. Y. . . . .	.	1	.	.	.	.	.	.	.	.
Charleston, S. C., College of . . . . .	.	.	.	.	.	.	.	.	1	.
Charlier Institute, New York . . . . .	.	1	.	.	.	.	.	.	.	.
Chase, R. H., Private School, Philadelphia, Pa. . . . .	.	3	2	1	.	.	.	.	.	.
Chauncy Hall School, Boston . . . . .	2	3	2	1	2	2	1	1	.	4
*Chelsea High School . . . . .	2	2	.	2	.	2	2	2	4	1
*Chicago, Ill., High School . . . . .	.	.	.	.	.	.	1	.	.	.
Christian College, Monmouth, Ore. . . . .	.	1	.	.	.	.	.	.	.	.
*Cincinnati, O., Hughes High School . . . . .	.	.	.	.	1	.	.	.	.	2
*Cincinnati, O., Woodward High School . . . . .	.	1	1	.	3	1	.	1	1	.
Cleveland, O., Academy . . . . .	.	.	.	2	.	.	.	.	.	.
*Cleveland, O., Central High School . . . . .	1	2	1	.	.	3	.	.	.	1
*Cleveland, O., West High School . . . . .	.	1	.	1	1	.	1	1	.	.
†Colby Academy, New London, N. H. . . . .	.	1	.	.	.	.	.	.	.	.
Colby University, Waterville, Me. . . . .	1	.	.	.	.	.	.	.	.	1
College of the City of New York . . . . .	.	.	.	.	3	.	.	2	1	1
College of Emporia, Kan. . . . .	.	.	.	.	.	.	.	.	.	1
College of New Jersey, Princeton, N. J. . . . .	.	.	.	2	.	.	.	1	.	.
†Collegiate and Polytech. Institute, Brooklyn, N. Y. . . . .	2	1	1	1	1	.	2	.	.	3
Colorado College, Colorado Springs, Colo. . . . .	.	.	.	.	.	.	1	.	.	.
Columbia College, New York . . . . .	.	.	1	1	.	.	.	1	1	.
Columbia College School of Mines, New York . . . . .	.	.	.	.	.	.	.	1	.	.
Columbian University, Washington, D. C. . . . .	.	1	.	.	.	.	1	1	.	.
*Concord High School . . . . .	.	3	2	.	.	.	.	2	.	1
Cornell College, Mt. Vernon, Iowa . . . . .	.	.	.	.	.	.	.	.	.	1
Cornell University, Ithaca, N. Y. . . . .	.	.	.	.	.	1	.	.	.	1
†Corning, N. Y., Free Academy . . . . .	.	1	.	.	.	.	.	.	.	.
†Cushing Academy, Ashburnham . . . . .	.	.	.	.	.	1	.	.	.	.
Cutler, A. H., Private School, New York . . . . .	2	1	4	1	.	2	2	1	4	3
Cutler, Edward H., Private School, Newton . . . . .	.	.	.	.	.	.	.	2	5	7
Dalhousie College, Halifax, N. S. . . . .	.	.	.	.	.	.	.	.	.	1
Dartmouth College, Hanover, N. H. . . . .	.	.	.	.	.	.	.	.	.	1
Dearborn Morgan School, Orange, N. J. . . . .	.	.	.	2	.	1	.	.	3	.
*Decatur, Ill., High School . . . . .	.	.	.	.	2	.	.	.	.	.
Delaware College, Newark, Del. . . . .	.	.	.	1	.	.	.	.	.	.
Denison University, Granville, O. . . . .	.	.	.	.	.	.	.	.	.	1
*Denver, Colo., High School . . . . .	.	.	.	1	.	.	2	1	.	.
†Derby Academy, Hingham . . . . .	.	1	.	.	.	.	.	.	.	.
Dickinson College, Carlisle, Pa. . . . .	1	.	.	.	.	.	.	.	.	1
†Dickinson High Sch. & Deerfield Acad., Deerfield . . . . .	.	.	.	.	.	1	.	.	.	.
*Dorchester High School . . . . .	.	1	.	.	.	.	.	.	.	1
Drury College, Springfield, Mo. . . . .	.	.	.	.	.	.	.	1	.	.
†Dummer Academy, South Byfield . . . . .	.	.	1	.	3	.	.	.	.	.
Dwight School, New York . . . . .	.	.	.	.	.	.	.	.	.	1
†East Maine Conference Seminary, Bucksport, Me. . . . .	.	.	.	.	1	.	.	.	.	.
Eayrs, Wm. N., Private School, Boston . . . . .	.	.	.	.	.	.	.	.	2	.
*Elkhart, Ind., High School . . . . .	.	.	.	.	.	1	.	.	.	.
*Ellsworth, Me., High School . . . . .	.	.	.	.	.	1	.	.	.	.
Emerson Institute, Washington, D. C. . . . .	.	1	1	4	2	.	1	.	.	.
Eminence College, Ky. . . . .	.	.	.	.	.	.	.	.	1	.
Episcopal Theological School at Cambridge . . . . .	.	.	.	.	.	.	1	.	.	1
†Eton College, England . . . . .	1	.	.	1	.	.	.	.	.	.
Eureka College, Eureka, Ill. . . . .	.	.	.	.	.	.	.	1	.	1
*Everett High School . . . . .	.	.	.	.	.	.	.	.	.	1
Everson, D. S., Collegiate School, New York . . . . .	.	1	.	.	1	.	1	.	.	.

	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
*Fall River, B. M. C. Durfee High School . . . .	.	2	.	.	.	.	.	1	1	1
Fish, C. E., Private School, Worcester . . . . .	.	.	.	.	.	.	.	.	1	5
Fisk University, Nashville, Tenn. . . . .	.	.	.	.	.	.	.	1	.	.
*Fitchburg High School . . . . .	.	.	.	.	.	1	1	1	.	.
Fort Hill School, Rochester, N. Y. . . . .	.	.	.	.	.	.	1	.	.	1
*Fort Wayne, Ind., Central Grammar School . . .	1	.	.	.	.	.	.	.	.	.
*Framingham High School . . . . .	.	1	.	.	1	.	.	.	.	1
Frankfurt Gymnasium, Germany . . . . .	.	.	.	.	.	.	.	1	.	.
Franklin and Marshall College, Lancaster, Pa. . .	1	.	.	.	.	.	.	.	.	.
†Friends' Academy, New Bedford . . . . .	1	.	.	2	2	1	1	2	.	1
*Gardner High School . . . . .	.	1	.	.	.	.	.	1	.	.
Georgetown College, D. C. . . . .	.	.	.	.	.	2	.	1	.	.
Gibbins and Beach, Private School, New York . .	1	2	1	.	.	.	.	.	.	.
*Gloucester High School . . . . .	.	2	1	2	2	1	1	1	.	3
Goff, C. B., Engl. & Class. Sch., Providence, R. I.	.	.	.	.	.	.	.	1	.	.
Griswold College, Davenport, Iowa . . . . .	1	.	.	.	.	.	.	.	.	.
Groton School, Groton . . . . .	.	.	.	.	.	1	3	.	11	1
Grove City College, Pa. . . . .	.	.	.	.	.	.	.	.	1	.
Gunnery School, Washington, Conn. . . . .	.	1	.	3	.	.	.	.	1	.
Hale, Albert, Private School, Boston . . . . .	.	.	.	.	.	.	.	.	3	5
Hamilton College, Clinton, N. Y. . . . .	.	.	.	1	.	1	.	1	.	.
Hamline University, St. Paul, Minn. . . . .	.	.	.	.	.	.	.	.	1	1
Hanover College, Ind. . . . .	.	.	.	1	.	.	.	.	.	.
†Harrow, England . . . . .	.	.	.	.	1	.	.	.	.	.
†Harry Hillman Academy, Wilkes-Barre, Pa. . .	.	1	.	2	.	1	.	.	.	.
*Hartford, Conn., High School . . . . .	.	1	1	.	.	.	.	1	.	.
Harvard Graduate Student . . . . .	.	.	.	.	1	.	.	1	.	.
Harvard College Special Student . . . . .	1	5	8	9	6	14	17	25	15	17
Harvard Divinity School . . . . .	.	.	.	.	1	.	.	.	1	2
Harvard Medical School, Boston . . . . .	.	.	.	.	.	.	.	.	.	.
Harvard School, Chicago, Ill. . . . .	.	1	.	1	.	3	4	4	3	1
Harvard Veterinary School, Boston . . . . .	.	.	.	.	.	.	.	.	1	.
Haverford College, Pa. . . . .	2	1	1	2	1	1	1	2	1	1
*Haverhill High School . . . . .	2	2	.	1	4	.	.	1	1	2
Hill School, Pottstown, Pa. . . . .	.	.	.	.	.	.	.	.	1	.
*Hingham High School . . . . .	.	.	.	1	.	2	.	.	.	.
Hobart College, Geneva, N. Y. . . . .	.	.	.	2	.	.	1	2	.	.
Holbrook's Military School, Sing Sing, N. Y. . .	.	.	.	.	.	.	.	1	.	.
Hopkinson, John P., Private School, Boston . . .	4	14	14	18	10	19	23	19	9	15
Howard College, Marion, Ala. . . . .	.	.	.	.	.	.	.	.	2	.
Howard University, Washington, D. C. . . . .	.	.	.	.	.	.	.	1	.	.
*Hyde Park High School . . . . .	.	1	1	.	.	.	2	.	.	.
*Hyde Park, Ill., High School . . . . .	1	.	.	.	1	.	.	.	.	.
Illinois State Normal University, Normal, Ill. .	.	1	1	2	.	.	.	.	1	.
Indianapolis, Ind., Classical School . . . . .	1	1	1	.	1	1	.	.	.	.
*Indianapolis, Ind., High School . . . . .	.	.	.	.	1	1	.	.	.	.
*Indiana State Normal School, Indiana, Pa. . . .	.	.	.	.	.	.	.	.	.	1
Indiana University, Bloomington, Ind. . . . .	.	2	.	.	.	.	.	.	.	.
Iowa College, Grinnell, Iowa . . . . .	.	.	.	.	.	.	.	.	.	2
†Ives Seminary, Antwerp, N. Y. . . . .	.	.	.	.	.	.	1	.	.	.
Jarvis Hall, Denver, Colo. . . . .	.	.	.	.	1	.	.	.	.	.
Johns Hopkins University, Baltimore, Md. . . .	.	1	.	1	.	.	.	.	1	.
*Kansas City, Mo., High School . . . . .	.	.	.	.	.	.	.	.	.	1
Kendall, Joshua, Private School, Cambridge . .	2	1	2	2	2	1	1	.	.	2
Kentucky Wesleyan College, Millersburg, Ky. . .	.	.	1	.	.	.	.	.	.	.
Kenyon College, Gambier, O. . . . .	.	.	.	.	.	.	1	.	.	1
Keystone Academy, Factoryville, Pa. . . . .	.	.	.	.	1	.	.	.	.	.
King's School, Stamford, Conn. . . . .	.	.	.	.	.	.	1	1	.	.

	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Knox College, Galesburg, Ill. . . . .	.	.	1	.	.	.	.	.	.	1
Lafayette College, Easton, Pa. . . . .	.	.	.	1	.	.	.	.	.	.
*Lancaster High School . . . . .	.	.	.	.	.	.	1	.	.	.
†Lawrence Academy, Groton . . . . .	1	.	.	.	.	.	.	.	.	.
*Lawrence High School . . . . .	.	1	.	1	1	1	.	.	.	.
Lawrence Scientific School, Cambridge	1	.	.	.	.	1	2	4	3	.
Lawrence University, Appleton, Wis. . . . .	.	1	.	.	1	.	.	.	.	.
†Lawrenceville School, N. J. . . . .	.	.	.	.	.	3	1	.	.	.
*Leominster, Field High School . . . . .	.	1	.	.	.	.	2	.	.	.
LeRoy, N. Y., Academy . . . . .	.	1	.	.	.	.	.	.	.	.
*Lexington High School . . . . .	.	.	.	.	.	.	1	.	.	.
*Louisville, Ky., Male High School . . . . .	.	.	.	.	.	1	.	.	.	.
*Lowell High School . . . . .	3	1	2	1	2	5	1	4	2	1
*Lynn High School . . . . .	1	.	1	2	3	2	2	1	3	1
†McCormick Institute, Mt. Vernon, N. H. . . . .	.	.	.	.	.	.	1	.	.	2
Madison University, Hamilton, N. Y. . . . .	.	.	.	.	.	.	1	.	.	2
*Malden High School . . . . .	1	3	.	.	.	.	.	1	.	.
Marietta College, Ohio . . . . .	1	.	.	.	.	.	.	.	.	.
Mass. Institute of Technology, Boston . . . . .	.	.	.	.	.	.	.	1	1	.
Milwaukee, Wis., Academy . . . . .	.	.	.	1	1	1	.	1	.	.
*Marlboro' High School . . . . .	.	.	.	2	1	1	.	1	.	.
Marlborough St. School, Boston . . . . .	.	.	.	.	.	.	1	.	.	.
Marston's University School, Baltimore, Md. . . . .	.	.	.	.	.	.	1	.	.	1
Maupin's University School, Ellicott City, Md. . . . .	.	.	1	.	.	.	.	.	.	.
*Medford High School . . . . .	.	.	.	1	.	1	.	2	1	.
*Melrose High School . . . . .	1	1	.	.	.	.	2	1	.	.
*Merrimac High School . . . . .	.	.	.	.	.	1	.	.	.	.
*Methuen High School . . . . .	.	.	.	.	.	.	.	.	1	.
*Michigan State Normal School, Ypsilanti . . . . .	.	.	.	.	.	.	1	.	.	.
Middlebury College, Vt. . . . .	.	.	.	.	.	.	.	1	.	.
*Milford High School . . . . .	.	1	2	.	2	2	.	.	.	.
*Milwaukee, Wis., High School . . . . .	1	.	.	2	.	1	.	2	.	.
Monmouth College, Ill. . . . .	.	.	.	.	.	.	.	.	1	.
*Montclair, N. J., High School . . . . .	.	.	.	1	.	.	.	.	.	1
*Montpelier, Vt., High School . . . . .	1	.	.	.	.	.	.	.	.	.
Morse, J. H., Private School, New York . . . . .	.	2	.	.	2	1	2	1	.	.
Mt. Allison College, Sackville, N. B. . . . .	.	.	.	1	1	.	.	.	1	.
Mt. Pleasant Military Academy, Sing Sing, N. Y. . . . .	.	1	.	.	.	.	.	.	.	.
Nashville, Tenn., State Normal College . . . . .	.	.	.	.	.	1	.	.	.	.
*Natick High School . . . . .	1	.	.	.	2	.	.	.	.	.
*Needham High School . . . . .	1	.	.	.	1	.	.	.	.	.
*Newark, N. J., High School . . . . .	.	.	.	.	.	.	.	1	.	.
*Newburyport, Brown High and Putnam Schools . . . . .	.	.	.	.	1	.	1	1	.	.
†New Church School, Waltham . . . . .	.	.	1	.	.	.	.	.	.	1
*Newport, R. I., Rogers High School . . . . .	2	2	.	1	2	6	1	3	1	.
*Newton High School . . . . .	5	4	5	4	2	5	2	4	4	5
Newton, N. J., Collegiate Institute . . . . .	.	.	.	1	.	.	.	.	.	.
New York School of Languages . . . . .	.	1	1	3	.	.	.	.	.	.
†Nichols Academy, Dudley . . . . .	.	1	.	.	.	.	.	.	.	.
Nichols, Wm., Private School, Boston . . . . .	.	1	4	2	10	1	5	.	2	5
Noble, G. W. C., Private School, Boston . . . . .	6	10	9	13	10	12	8	12	9	8
*Northampton High School . . . . .	1	1	.	.	.	.	.	.	.	.
*North Attleboro' High School . . . . .	.	.	.	.	.	.	1	.	.	.
Northwestern University, Evanston, Ill. . . . .	.	.	.	.	.	.	1	.	.	3
Oberlin College, Ohio . . . . .	.	.	.	1	.	2	1	1	.	1
Ohio Wesleyan University, Delaware, O. . . . .	.	.	.	1	1	6	.	.	.	1
*Omaha, Neb., High School . . . . .	.	1	.	.	.	.	.	.	.	1
Park Institute, Rye, N. Y. . . . .	.	.	.	.	1	.	.	.	.	.





	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Université de France . . . . .	1									
University Grammar School, Providence, R. I. . . . .									1	
University of Alabama, Ala. . . . .									1	
University of California, Berkeley, Cal. . . . .	1							1	2	
University of Chicago, Ill. . . . .			1							
University of Cincinnati, O. . . . .			1							
University of the City of New York . . . . .	1								1	
University of Des Moines, Iowa . . . . .		1								
University of Georgia, Athens, Ga. . . . .							1			
University of Illinois, Champaign, Ill. . . . .				1						
University of Kansas, Lawrence, Kan. . . . .									3	
University of Michigan, Ann Arbor, Mich. . . . .				3	2	1		2		
University of New Brunswick, Fredericton, N. B. . . . .							1		2	
University of Oregon, Eugene City, Ore. . . . .							1			
University of Pennsylvania, Philadelphia, Pa. . . . .	1		1	1	1	1		1		
University of Rochester, N. Y. . . . .		1	2				1	1		
University of State of Missouri, Columbia, Mo. . . . .									1	
University of Tennessee, Knoxville, Tenn. . . . .		1								
University of Vermont, Burlington, Vt. . . . .							1			
University of Virginia, Va. . . . .							1			
University of Wisconsin, Madison, Wis. . . . .			1						2	
University of Wooster, O. . . . .										
University School, Chicago, Ill. . . . .			2	2			3			
University School, Petersburg, Va. . . . .				1						
University School, San Francisco, Cal. . . . .	2									
Urban School, San Francisco, Cal. . . . .	3	1				2			1	
Utica, N. Y., Academy . . . . .	1		1	1						
Vanderbilt University, Nashville, Tenn. . . . .									2	
†Vermont Academy, Saxton's River, Vt. . . . .				1						
†Vermont Episcopal Institute, Burlington, Vt. . . . .	1		1	1						
*Wakefield High School . . . . .								1		
*Waltham High School . . . . .	1					1			1	
Warsaw, N. Y., Union School . . . . .		2			1					
Washburn College, Topeka, Kan. . . . .									1	
*Washington, D. C., High School . . . . .									2	
*Washington Co., Vt., Grammar Sch., Montpelier . . . . .					1					
Washington University, St. Louis, Mo. . . . .	1				1	1				
*Watertown High School . . . . .									1	
*Wellesley High School . . . . .									1	
Wesleyan University, Middletown, Conn. . . . .	3		1						2	
†Western Reserve Academy, Hudson, O. . . . .							1			
*Westfield High School . . . . .	1									
West Newton English and Classical School . . . . .						2		1		
White & Sykes, Franklin School, Cincinnati, O. . . . .	1	4		3	2	3	2	3		
William Jewell College, Liberty, Mo. . . . .			1							
†William Penn Charter School, Philadelphia, Pa. . . . .					1		1	1	3	
Williams College, Williamstown . . . . .				1		1				
†Williston Seminary, East Hampton . . . . .	3				4					1
Wilson and Kellogg, Private School, New York . . . . .	1	3	1	2		1	2	2		
*Winchester High School . . . . .						1		1		
*Winsted, Conn., High School . . . . .								1		
*Woburn High School . . . . .		1				2		1		
*Woonsocket, R. I., High School . . . . .	1									
†Worcester Academy . . . . .	1			2	1			1	2	
*Worcester High School . . . . .	1	3	1	1	2	2	2	1	3	4
†Worcester Polytechnic Institute . . . . .							1		1	
Yale College, New Haven, Conn. . . . .	2			1		1			2	
Private Pupils . . . . .	48	53	36	37	30	36	33	31	33	54



# INDEX.

	PAGE.
Academic Year . . . . .	54
Administrative Officers and their duties . . . . .	3, 4, 5
Admission conditions, number allowed . . . . .	50, 51
removal of . . . . .	51
Admission to the College . . . . .	37, 50, 51-53
Scientific School . . . . .	58
Graduate School . . . . .	61
Divinity School . . . . .	64
Law School . . . . .	68
Medical School . . . . .	70
Dental School . . . . .	77
Veterinary School . . . . .	80
Bussey Institution . . . . .	82
Advanced Standing . . . . .	53, 54, 58, 60, 64, 77
Advanced Studies for Admission to the College . . . . .	45
Greek . . . . .	45
Greek Composition . . . . .	45
Latin . . . . .	46
German . . . . .	47
French . . . . .	47
Mathematics . . . . .	48
Physics . . . . .	48
Chemistry . . . . .	49, 50
Advisers . . . . .	54, 59
Agassiz Museum . . . . .	91, 99, 100
Agriculture, School of . . . . .	82, 99
Aids . . . . .	7, 58, 62, 66, 71, 82, 86, 98, 99
Annual Expenditures of the University . . . . .	98, 99
Arboretum Museum . . . . .	91, 95, 101
Archaeology and Ethnology, instruction in . . . . .	35, 36
Museum of . . . . .	91, 93
Arequipa, branch Observatory in . . . . .	85
Arnold Arboretum . . . . .	5, 82, 94, 95, 99
Art Museum . . . . .	91, 101
Arts and Sciences, instruction in . . . . .	15-36, 55
Astronomical Observatory . . . . .	85, 86, 99, 100
Athletic buildings, sports, and grounds . . . . .	6, 103
Athletic contests not open to students who are not in good standing . . . . .	6
Average age at admission . . . . .	69
Bachelor of Arts, requirements for degree of . . . . .	54, 55
Bachelor of Science, requirements for degree of . . . . .	58, 59
Blaschka flowers . . . . .	92

Board, cost of . . . . .	5
Boat-houses . . . . .	6, 103
Bond . . . . .	54
Boston—Schools of Medicine, Dental medicine and Veterinary medicine, situated in . . . . .	3
Botanical Museum . . . . .	91, 92, 99 100
Botanic Garden . . . . .	94, 99
Boyden Fund . . . . .	85
Boylston Chemical Laboratory . . . . .	90, 100
Bruce Photographic Telescope . . . . .	85
Buildings and Grounds of the University, dates and approximate cost . . . . .	100, 101
Bussey Institution . . . . .	3, 82, 99, 100
Candidacy for higher degrees . . . . .	60, 61
Carey Athletic building . . . . .	101, 103
Certificate of admission, when sent . . . . .	53
good in future years . . . . .	53
Certificate of Preparation . . . . .	51
may sometimes be from the candidate himself . . . . .	51
Chapel . . . . .	5, 96, 97, 99, 100
Chemical Laboratory . . . . .	90, 100
Church seats . . . . .	97
Class Day . . . . .	56
Class-room libraries . . . . .	87, 89
Clinical facilities . . . . .	70
Coins . . . . .	91
Collections in Museums . . . . .	91, 92
College Conferences . . . . .	97
College examinations . . . . .	55
Commencement Day . . . . .	56, 102
Concerts, lectures, etc. . . . .	102
Coöperative Society . . . . .	5
Corporation . . . . .	3
Cost of Museum Collections . . . . .	91, 93
Cost of University Buildings . . . . .	100, 101
Courses of Instruction . . . . .	13, 55, 58, 64, 67, 71, 77
Cryptogamic Herbarium . . . . .	94
Curtis Collection of Fungi . . . . .	94
Date of erection of University buildings . . . . .	100, 101
Date of foundation of Harvard College . . . . .	3
Degree of M. D. conferred upon graduates of other Medical Schools after one years' residence, etc. . . . .	76
Degrees . . . . .	54, 61, 68, 69, 70, 77, 79, 80, 82, 105
Degrees with distinction . . . . .	4, 54, 56, 68
Dendrological Collections . . . . .	94, 95
Dental diploma accepted under the British Dental Act . . . . .	79
Dental School . . . . .	13, 77-79, 99, 100
Department libraries . . . . .	87, 89
Departments . . . . .	3, 4, 5, 98, 99
Descriptive pamphlets . . . . .	55
Dining Associations . . . . .	5. 54
Discipline . . . . .	54



Distinguished graduates . . . . .	57, 66, 67
Divinity Library . . . . .	101
Divinity School . . . . .	3, 13, 64-66, 96, 97, 99, 100
Division of Admission examinations . . . . .	51
Dormitories . . . . .	5, 66, 100, 101
"Dropping" . . . . .	55, 56
Earnings of students . . . . .	7
Economy in students' living . . . . .	8-12
Elective courses . . . . .	55
descriptive pamphlets regarding . . . . .	55
Elementary studies for Admission to the College . . . . .	38-44
English . . . . .	38
Greek . . . . .	39
Latin . . . . .	39
German . . . . .	40
French . . . . .	40
History . . . . .	41
Mathematics . . . . .	41-43
Physics . . . . .	43
Employment after graduation . . . . .	12, 68
Enrolment in courses . . . . .	54
Evening readings and lectures . . . . .	102
Examinations . . . . .	51-53
Examiners not to take fees payable to the Bursar . . . . .	52
Expenditures . . . . .	87
Expenses of Students . . . . .	7, 8, 12, 79, 82
Farlow Collection of Algae . . . . .	94
Fees for examination outside of Cambridge . . . . .	52
must be sent to the Bursar, not paid to the Examiner . . . . .	52
Fellowships . . . . .	7, 62, 66, 71, 98, 99
Final Examination . . . . .	52
Fitting Schools . . . . .	50, 106
Fogg Art Museum . . . . .	91, 101
Forestry, instruction in . . . . .	95
Founding of Harvard College . . . . .	3
Foxcroft Club . . . . .	5
Freshman electives . . . . .	55
<i>Garden and Forest</i> . . . . .	95
Garland collection of gems . . . . .	93
Gifts . . . . .	98, 99
Glass-flowers . . . . .	92
Gore Hall . . . . .	87, 100
Government . . . . .	3, 4, 5, 6, 58, 60
Graduates . . . . .	4, 57, 66, 67, 70, 79, 81
Graduate School . . . . .	3, 13, 54, 60-63, 98
Graduates of other Colleges at Harvard . . . . .	14, 53, 54, 62, 65, 69
Graduation in less than four years . . . . .	55
Gray Herbarium . . . . .	94
Group system . . . . .	58
Growth of the University . . . . .	12, 13, 59, 105
Gymnasium . . . . .	5, 6, 99, 100, 101

Hamlin Collection of tourmalines . . . . .	93
Harvard College . . . . .	3, 37-98
<i>Harvard Graduates Magazine</i> . . . . .	6
Hemenway Gymnasium . . . . .	5, 6, 99, 100, 103
Herbaria . . . . .	94, 95
<i>Historical Monographs</i> . . . . .	6
Holmes Field . . . . .	101, 103
Home residence of students . . . . .	14
Honorary degrees . . . . .	4, 105
Honors . . . . .	18, 54, 56, 57
Horticulture, School of . . . . .	82
Hospitals and infirmaries . . . . .	70, 76, 77, 80
Hunnewell Museum Building . . . . .	91, 95, 101
Increase of the library . . . . .	12, 88, 89
Instruction in Arts and Sciences . . . . .	15-36
Semitic . . . . .	15
Sanskrit . . . . .	16
Classical Philology . . . . .	16-19
English . . . . .	19
German . . . . .	20
French . . . . .	20
Italian, Spanish, Romance Philology and Comparative Literature . . . . .	21-22
Philosophy . . . . .	22-26
Education and Instruction . . . . .	24-26
History and Political Science . . . . .	26-28
Fine Arts and Music . . . . .	28
Mathematics . . . . .	29
Engineering . . . . .	30
Physics . . . . .	31
Chemistry . . . . .	32
Botany . . . . .	33
Zoölogy . . . . .	33, 34
Geology . . . . .	34, 35
American Archaeology and Ethnology . . . . .	35, 36
Instruction in Dental Medicine . . . . .	77-79
Instruction in Forestry . . . . .	82
Instruction in Law . . . . .	67-69
Instruction in Medicine . . . . .	71-76
Anatomy . . . . .	71
Physiology . . . . .	71, 72
Chemistry . . . . .	72, 73
Pathology . . . . .	73
Clinical Medicine . . . . .	74
Surgery and Clinical Surgery . . . . .	74, 75
Graduate Instruction in Medicine . . . . .	75
Summer courses . . . . .	76
Instruction in Theology . . . . .	64-66
Instruction in various departments given for a single fee . . . . .	59, 60, 82
Instruction in Veterinary Medicine . . . . .	80
Jamaica Plain, Arboretum and Bussey Institution, situated in . . . . .	82

Jarvis Field . . . . .	101, 103
Jefferson Physical Laboratory . . . . .	90, 101
Laboratories . . . . .	90, 100, 101
Land, in acres, used by the University . . . . .	101
Lawrence Scientific School . . . . .	58, 59, 82, 100, 102
<i>Law Review</i> . . . . .	6
Law School . . . . .	3, 13, 67-69, 99, 101
Lecture-rooms and their uses . . . . .	102
Library . . . . .	4, 12, 66, 70, 87-89, 95, 99, 100
List of Harvard fitting schools . . . . .	106-111
Loan Furniture Association . . . . .	5, 10
Longfellow Marshes . . . . .	103
Medical School . . . . .	3, 13, 70-76, 99, 100
Memorial Hall . . . . .	5, 100
Meteorites, Collection of . . . . .	93
Mineralogical Museum . . . . .	91, 92, 101
Moral Character certificates . . . . .	52
Museums . . . . .	91-93, 101
Museum of Comparative Zoölogy . . . . .	91, 99, 101
Natural History Laboratories . . . . .	90, 101
Non-graduates may enter Graduate School if qualified . . . . .	61
Normal School Scholarships . . . . .	59
Norton field . . . . .	103
Notice of intention to take examinations . . . . .	52
Number of officers and students . . . . .	12, 70, 80, 83, 105, 106-111
Observatory . . . . .	85, 86, 100
Officers of the University . . . . .	3, 4, 5
Overseers . . . . .	3
Pamphlets in the library . . . . .	87
Peabody Museum . . . . .	90, 91, 93, 101
Peru, branch Observatory in . . . . .	85
Physical Laboratory . . . . .	90
Physiological Laboratory . . . . .	90
Places where June examinations are held . . . . .	52
Preachers to the University . . . . .	5, 96
Preliminary Certificates, good in future years . . . . .	52
Preliminary Examinations . . . . .	51
Preparatory Schools, list of . . . . .	106-111
Price Greenleaf Aid . . . . .	8-12, 53, 54
Prizes . . . . .	7, 104
Probation . . . . .	54, 55
Psychological Laboratory . . . . .	23, 90
Publications of the University . . . . .	6, 95
of Students . . . . .	7
<i>Quarterly Journal of Economics</i> . . . . .	6
Rank lists . . . . .	55
Ratio of teachers to students . . . . .	13
Receipts and Expenses of the University . . . . .	98
Registration . . . . .	54, 62
Religious Exercises . . . . .	96
Religious Societies . . . . .	97

Requirements for admission, College . . . . .	37-53
Scientific School . . . . .	58
Graduate School . . . . .	61
Divinity School . . . . .	64
Law School . . . . .	68
Medical School . . . . .	70
Dental School . . . . .	77
Veterinary School . . . . .	80
Bussey Institution . . . . .	82
Requirements for the degree of A.B. . . . .	54, 55, 61
A.M., Ph.D. and S.D. . . . .	61, 69
S.B. . . . .	58, 59
D.B. . . . .	64
LL. B. . . . .	68, 69
M.D. . . . .	70, 71
D.M.D. . . . .	77
M.D.V. . . . .	80
B.A.S. . . . .	82
Retiring Allowance Fund . . . . .	99
Room rents . . . . .	5, 66
Salaries . . . . .	98, 99
Sanders Theatre . . . . .	102
Scholarships . . . . .	7, 58, 62, 66, 68, 71, 98, 99
Scientific School . . . . .	3, 58, 59, 82, 98, 100
Sears Laboratories . . . . .	70, 73, 101
Seats in churches of all denominations provided for students . . . . .	97
Semitic Museum . . . . .	93
<i>Silva of North America</i> . . . . .	95
Soldier's Field . . . . .	101, 103
Special Students . . . . .	51, 59
Stellar photography . . . . .	85
Student Clubs and Societies . . . . .	6, 59, 63, 97, 102
Summer School . . . . .	13, 76, 83, 84, 99
Terms . . . . .	13, 55
Theological Seminaries in and near Cambridge . . . . .	97
Tuckerman Collection of Lichens . . . . .	94
Tuition . . . . .	8, 82, 98, 99
University Buildings and Grounds . . . . .	100, 101
University Library . . . . .	87-89, 100
University Museum . . . . .	91, 101
University Receipts and Expenses . . . . .	98
Unsuccessful candidates for admission, percentage of . . . . .	37, 56
Use of the library . . . . .	87, 88
Veterinary Hospital . . . . .	80, 81, 101
Veterinary School . . . . .	3, 13, 80, 81, 99, 101
Volumes in the library . . . . .	12, 87
Ware Collection of Glass-flowers . . . . .	92
Warren Anatomical Museum . . . . .	5, 81, 91



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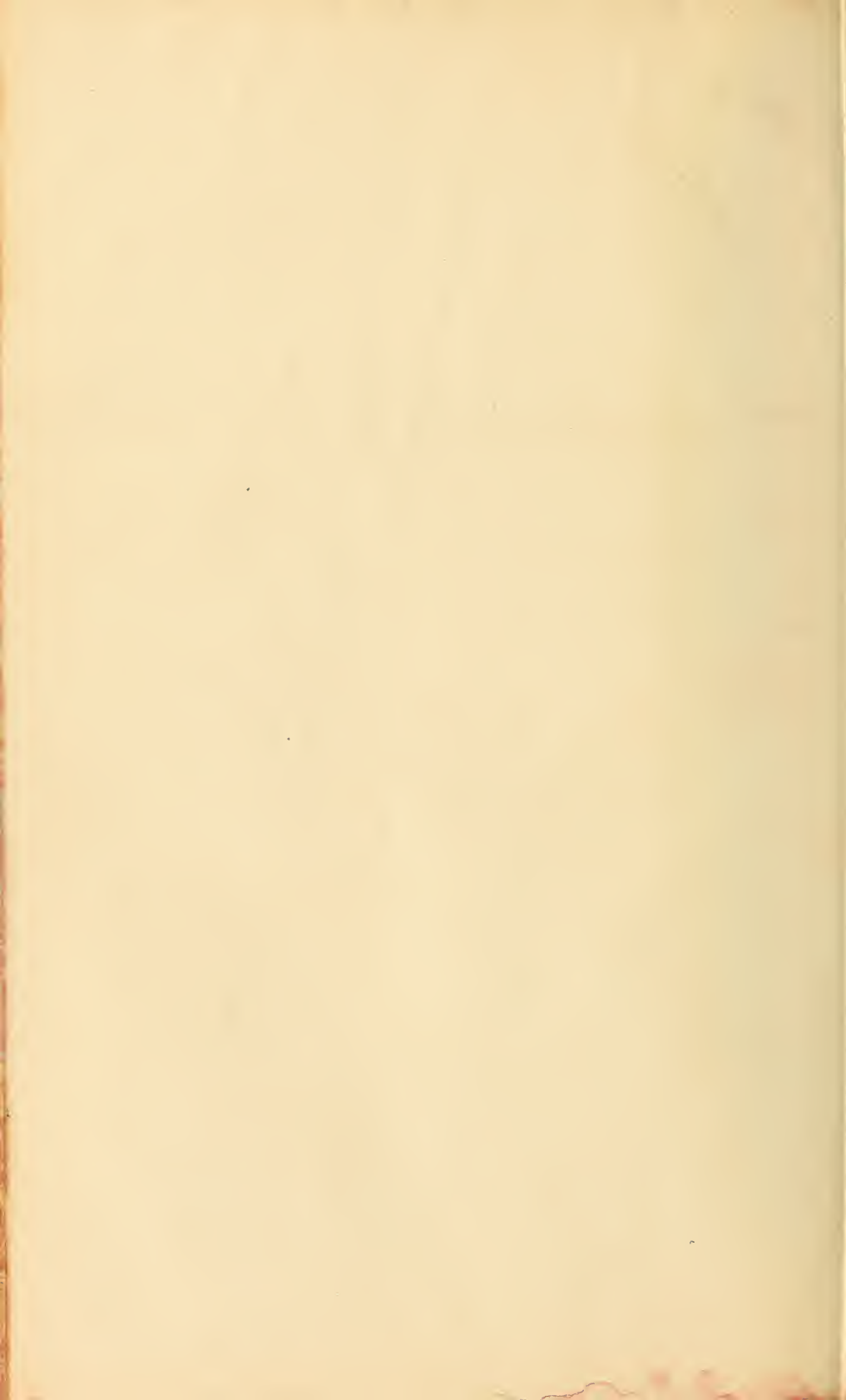








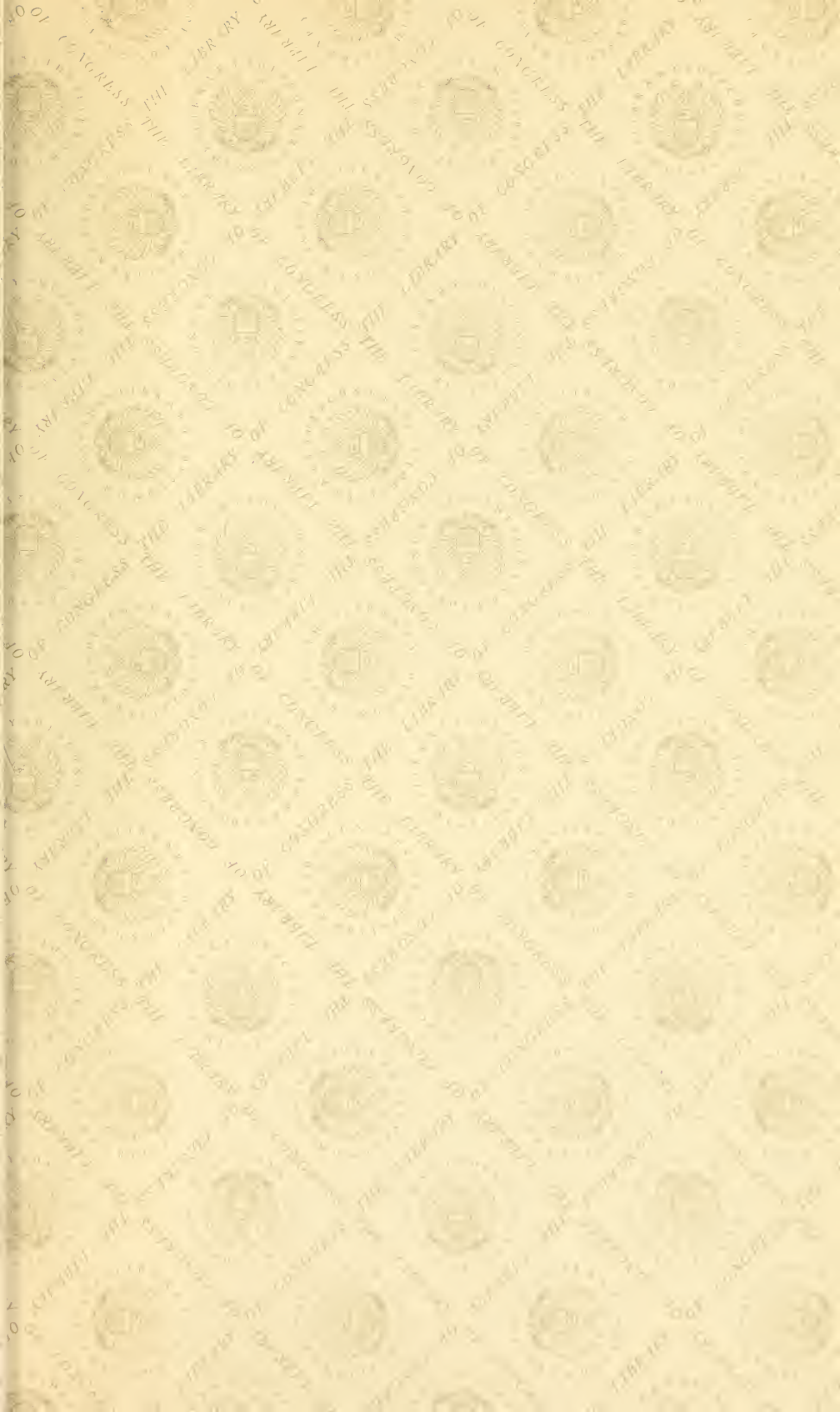












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